SEPTEMBER 1, 1997 VOLUME 14, NUMBER 35

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

WIN A NIGHT ON THE TOWN

Enter the User Excellence Awards competition. Page 15.

NETWORK WORLD/DELOITTE & TOUCHE CONSULTING GROUP SALARY SURVEY

Write your ticket

By Tom Duffy

As an employee, you hold all the salary cards. As a manager, you're facing stiff competition for talent; you've got to innovate to survive.

Three months ago, Ken Weaver (pictured above) left his job as a network engineer for the University of North Carolina (UNC) at Chapel Hill. In three years at UNC, he built and upgraded the school's computer network to the point that it needed little maintenance. Like the Maytag repairman, Weaver had little to occupy his time.

In search of new challenges, as well as benefits that a state-owned operation such as UNC couldn't offer, Weaver took a similar position at SAS Institute, Inc., an 11-year-old software development firm in nearby Cary.

At SAS, a firm with more than 4,700 employees worldwide, Weaver is working on a much larger network. He's dealing with LAN and WAN connectivity issues, and he's getting to know the intricacies of ATM and FDDI.

SAS, which is routinely listed as a top-notch company to work for by *Working Woman* magazine, also offers on-site day care. That was a critical perk for Weaver, the father of then 9-month-old Elizabeth.

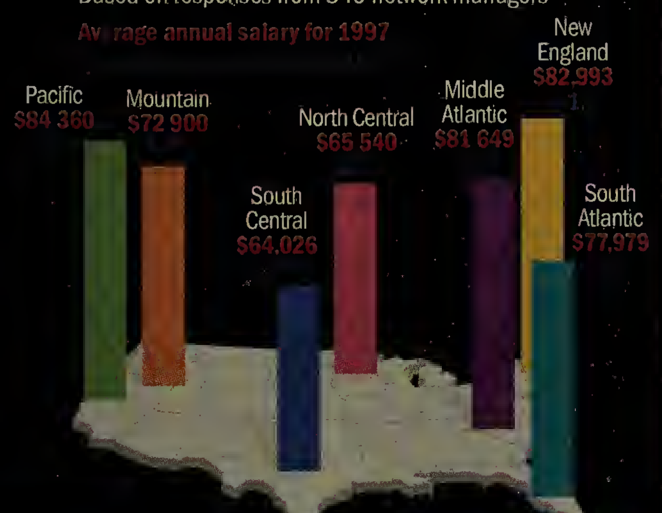
On top of all that, he got an 8% raise.

See 1997 Salary Survey, *page 44*

CHARLES BROWN

REGIONAL SALARY BREAKDOWN

Based on responses from 349 network managers



Token ring on the fast track

Vendors agree to forge High-Speed Token Ring standard.

By Jodi Daniels
Boston

The top token-ring vendors are attempting to resuscitate the moribund LAN technology by launching one of the most ambitious standards and product development efforts ever.

The multivendor effort, forged at the second Token Ring Futures roundtable sponsored by The Tolly Group and *Network World*, promises to deliver a dedicated, native High-Speed Token Ring technology that scales from 100M bit/sec to at least a gigabit.

High-Speed Token Ring backers include heavyweights 3Com Corp., Bay Networks, Inc., Cabletron Systems, Inc., Cisco Systems, Inc., IBM and Madge Networks, Inc. Customers are expected to use the turbo-boosted token-ring for backbone and server links where bandwidth is most needed.

Robert Love, *chairman of the IEEE 802.5 committee, helps work out the details of the High-Speed Token Ring standard.*

The first demonstrations of High-Speed Token Ring will occur at NetWorld+Interop 98 in Las Vegas — which means a draft standard and working prototypes of the technology must be developed in just nine months.

Speedy standard

Why move so fast? Because token-ring users have not seen an increase in basic transmission rates since the 16M bit/sec version was introduced in 1988. Vendors have to hustle if they want to hang on to major corporate customers that are considering tossing overtaxed token-ring LANs in favor of more strategic technologies such as Fast/

See Token ring, *page 65*

Tips and tales from the frame relay trenches

By David Rohde

Paul Robideux didn't think frame relay could blow up his SNA controllers, but one day it did. Bruce Thatcher didn't know frame relay could make a company's 800 budget soar, but he discovered it can. Robert Nebiker didn't believe he could justify a frame relay connection at a small branch office, but he learned how to do just that.

And so it goes in the frame relay world, where soaring demand along with a shortage of high-capacity circuits and the

See Design, *page 14*

Get more online:

- Our audio primers on frame relay and voice over frame relay
- Overviews of software for monitoring service level agreements

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Novell GroupWise to 'Surge' ahead

By Paul McNamara
Orem, Utah

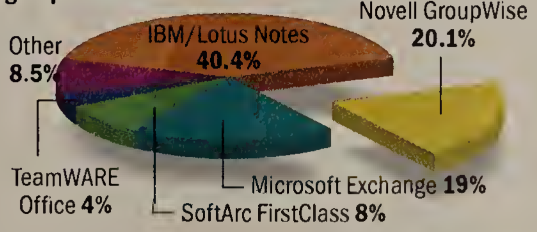
With GroupWise 5.2 slated to ship any day, Novell, Inc. already is working on a follow-on, code-named Surge.

According to customers that have been briefed, Surge will accelerate the Internet makeover that GroupWise badly needs to keep pace with rival groupware/messaging products such as Lotus Development Corp.'s Lotus Notes, Microsoft Corp.'s Exchange and Netscape Communications Corp.'s Communicator. These customers said Surge is likely to include client support for the Lightweight Directory Access Protocol (LDAP); improved calendaring and scheduling; and an enhanced Web Access client. In addition, Surge is expected to feature the fruits of Novell's long-anticipated Jefferson Project, although this Web-based document management technology may eventually emerge as an add-on rather

See Surge, *page 64*

GROUPWISE IS STUCK IN MIDDLE FOR NOW

Percentages of 1996 new network-based groupware users



SOURCE: IDC, FRAMINGHAM, MASS. Based on a total of 10.7 million new users.

Novell preps directory service add-ons. Page 6.

TOLLY says...

Columnist Kevin Tolly says the High-Speed Token Ring effort makes the LAN technology strategic again. Page 28.

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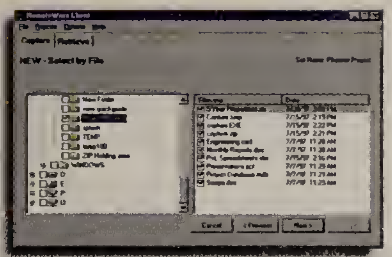
STEVE BORNS

WHAT'S A WEBPHONE?

Alcatel's Patrick Liot talks up new devices for making phone calls and dialing in to the Web. Page 10.

TELECOMMUTING BACKUP



New CoreData software handles backup and other pesky remote access chores. Page 17.

MIGRATION PATH

Cabletron's new MicroLAN devices pave the way from shared to switched LANs. Page 25.

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SPECIAL FOCUS

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If your SMP servers are pooping out, NUMA may be the answer. Page 20.

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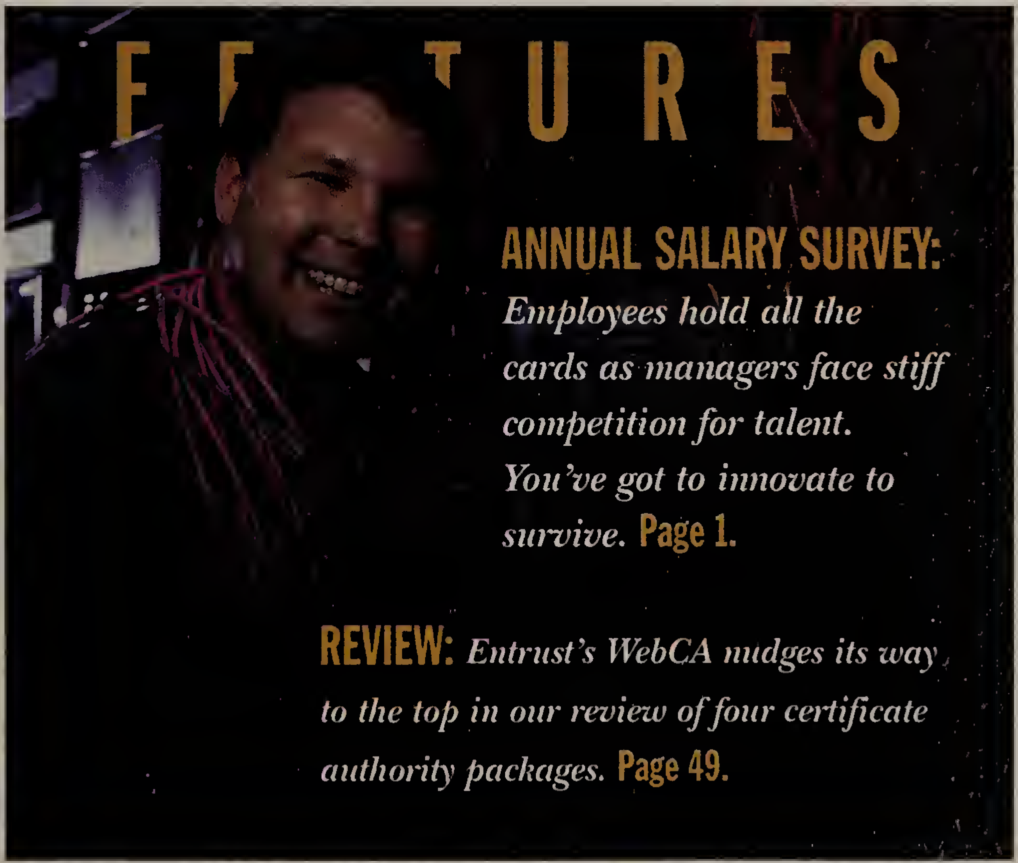
CHARLES BROWN

ANNUAL SALARY SURVEY: *Employees hold all the cards as managers face stiff competition for talent. You've got to innovate to survive.* Page 1.

REVIEW: *Entrust's WebCA nudges its way to the top in our review of four certificate authority packages.* Page 49.

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This Week

Only on Fusion

Keeping Current. Fred McClimans to Digital: Knock it off, admit you made a mistake and sell off the Networking Business Unit already. It'll do everyone a world of good. **DocFinder: 3624**

Messaging. Microsoft this week said that a potential security hole found by a user of its Exchange server is really no big deal – and users can reduce or eliminate the hole entirely. **DocFinder: 3625**

Client/server. A number of vendors last week introduced new products for SAP's R/3 environment. **DocFinder: 3626**

Log on to Fusion this week

On Sept. 8, we're moving Fusion to a new registration system based on cookies. If you visit the site this week, our existing server will deposit a cookie on your machine so you won't have to supply a user name and password after the switchover. However, even after Sept. 8, your existing user name and password will work – and we'll have a password lookup system just in case. Get more details of the change online. **DocFinder: 3533**

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News briefs, September 1, 1997

IBM snubs Cisco retest request

■ IBM last week flatly rejected a proposal made by Cisco Systems, Inc. and others in the industry to hold a public test comparing IBM's mainframe channel-attached boxes with Cisco's (*NW*, Aug. 25, page 30). IBM last month issued a performance test audited by an independent test firm that showed IBM's channel-linked router outperformed Cisco's. Cisco rejected results of the test.

Also last week, Ray Holland, senior manager of Cisco's InterWorks Business Unit, sent an official letter to Rick McGee, IBM's vice president of strategy and business development, suggesting the two companies conduct a public multiprotocol network design and performance comparison.

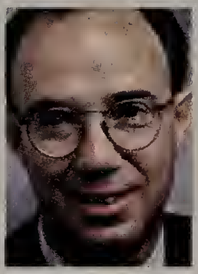
In response, IBM said: "We painstakenly took the precaution of using the best equipment available on the open market from both companies. More importantly, it was audited by a respected testing organization. The Tolly Group certified the results, and we feel no need to challenge their credibility. We will not respond to this blatent attempt to create FUD over the tests and disrespect the audit of the tests."

Novell not on the block

■ Novell, Inc. CEO Eric Schmidt last week tried to lay to rest rampant industry rumors that the floundering network software firm is in merger talks with IBM. The rumor had escalated early last week when Novell stock took a 20% jump in anticipation of an IBM takeover. But Schmidt frankly told a crowd of reporters at the Java Internet Business Expo in New York last Wednesday, "The company is not for sale." However, Schmidt tempered that response with a caveat saying if the two companies were in negotiations, they would be legally bound not to comment.

Lotus settles with Radnet

■ Lotus Development Corp. and Radnet, Inc., have settled their legal dispute. Lotus alleged that Radnet founder Donald Bulens violated his employment termination agreement with them last year when Radnet hired a top Lotus sales representative. Bulens, who spent 10 years at Lotus, denied he played any personal role in the hiring or violated his contract in any way. Neither of the Cambridge, Mass.-based competitors would disclose details of their settlement, although a Radnet spokesman said his company was "pleased with the terms."



Donald Bulens

SAP breaks up R/3

■ SAP AG last week announced that its enterprise business application suite, R/3 Version 4.0, which is set to ship by year-end, will be broken into more flexible components. The components will help customers more easily pick and choose what applications they need, rather than buying one big, all-encompassing package. R/3 application suites range from sales and financial management to human resources. SAP also is improving its supply chain logistics software in the area of forecasting and graphical decision-making. In addition, R/3 Version 4.0 will support Microsoft Corp.'s Distributed Component Object Model and ActiveX, as well as the Common Object Request Broker Architecture and Java.

Hundt to techies: Help me quash monopolies

■ Federal Communications Commission Chairman Reed Hundt enlisted Silicon Valley in his fight for more power to break up local telephone monopolies. In a speech last week to the IEEE in Palo Alto, Calif., Hundt said high prices for T-1 circuits are stifling usage of dedicated links to Internet service providers. He also criticized the continuing investment by local carriers in their predominantly circuit-switched networks, which "is far from ready to handle several hours of Internet traffic per household, per day." Hundt recently asked Congress for authority to set national telecom reform pricing rules, after a court ruled that the Telecommunications Act of 1996 gives most of that power to the states.

Novell to extend directory services

WAN traffic and event management and partitioning services on tap.

By Christine Burns
Provo, Utah

Novell, Inc. is putting the finishing touches on several directory service add-ons that, for a price, will make Novell Directory Services (NDS) easier to use, manage and deploy in enterprise networks.

But as the company readies its cataloging, WAN traffic management, federated partitioning and global event management add-ons, customers are leery about paying extra for features they think should just be rolled into NDS.

"I'll pay if I get something unique that adds value," said Bill Kannberg, a network administrator who manages a 2,000-seat IntranetWare network for a government agency in Tampa, Fla.

But he is not likely to pay for the upcoming cataloging software, which condenses hierarchical NDS information into a flat file that administrators can search through more quickly and easily.

"The point of NDS is to make your network easier to manage. Why should I pay any extra for ease-of-use features? They should be in the box," Kannberg said.

Netscape Communications Corp. offers a catalog server with its SuiteSpot offering and Banyan Systems, Inc. ships StreetTalk Directory Assistance as a free component of its StreetTalk directory.

Microsoft Corp. has indicated there will be a cataloging service in its upcoming NT 5.0 Active Directory.

Novell also should deliver its yet-to-be-released WAN Traffic Management service for NDS gratis, said Paul Schols, a systems engineer with Farmland Foods, based in Kansas City, Mo.

This new service will give administrators granular control over when and how often directory updates are passed over slow links.

The utility would likely be useful in controlling how directory information is updated across Farmland Foods' 60 NetWare 4.X servers, which are dispersed throughout the Midwest and Mexico, Schols said.

"But you can only spend so much money on fancy bells and whistles before you have to draw the line," he said.

According to Michael Simpson, Novell's director of product marketing for NDS, the cataloging and WAN traffic management products should be available by year-end as add-on services.

NDS additions

Two additional NDS add-ons scheduled for release next year are global event management and federated partitions.

The global event management service would allow administrators to define how certain network events can trigger other seemingly unrelated events to occur.

For example, an administrator could set up an event sequence so that every time an end user changed his password, all of his local files would be scanned for viruses.

Federated partitions create a soft link between customers' private and public directory trees, enabling both to be synchronized and centrally managed without exposing any part of the private tree.

The event management and federated partition services grew from Novell partnerships with AT&T, Deutsche Telekom and Nippon Telegraph and Telephone Corp.

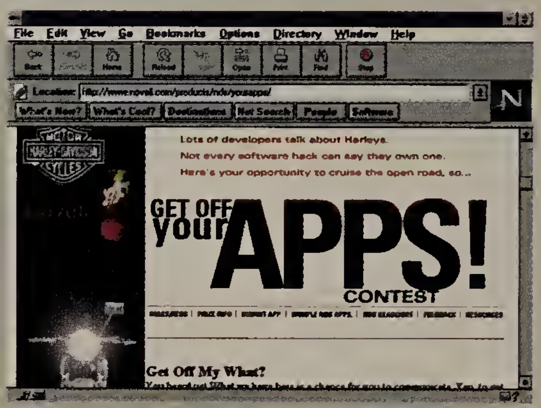
These carriers all have licensed NDS to provide secure Internet and private wide-area access to customers.

But these NDS add-ons may only appeal to very high-end Novell users, according to one analyst.

"They're going to have to reach pretty far up on the pyramid of corporate NDS users to find anybody who really needs federated partitions," said Shilpa Agarwall, a directory analyst with Giga Information Group in Cambridge, Mass.

"I don't expect your average IntranetWare user will be willing to pay extra for them," Agarwall said. ■

Wooing NDS developers



Lots of developers talk about Harleys.
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Get Off My What?

Novell is attempting to bolster its independent software vendor (ISV) support for Novell Directory Services (NDS). Under the terms of the company's "Get Off Your Apps!" contest, the ISV producing the coolest new NDS application by March 2, 1998 will ride away from Novell's 1998 BrainShare user conference on a Harley-Davidson. Runner-up prizes include computer systems, all-expense-paid trips to BrainShare '98 and six-month supplies of pizza and Jolt cola. **For more information, visit www.novell.com/products/nds/yourapps/.**

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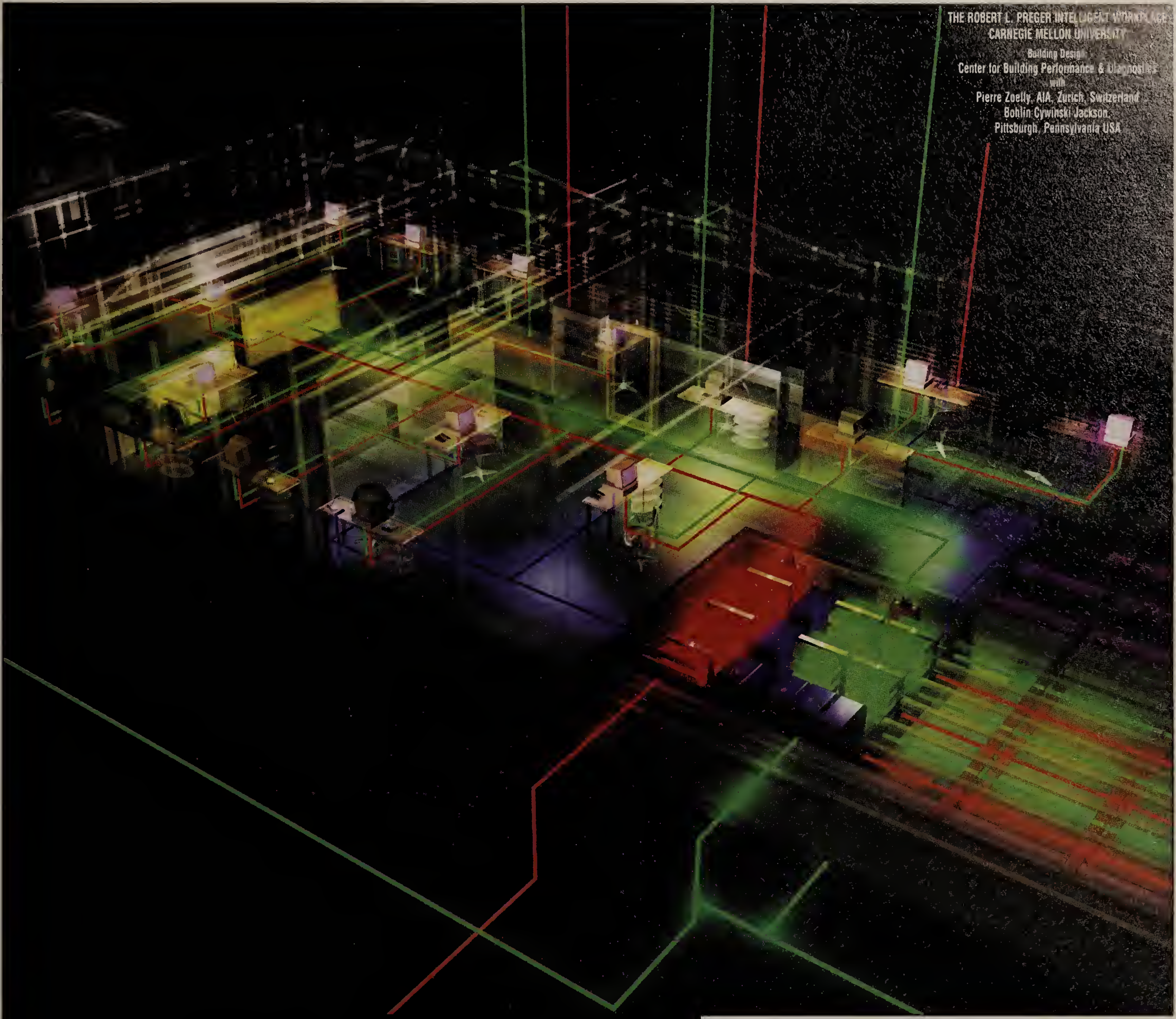
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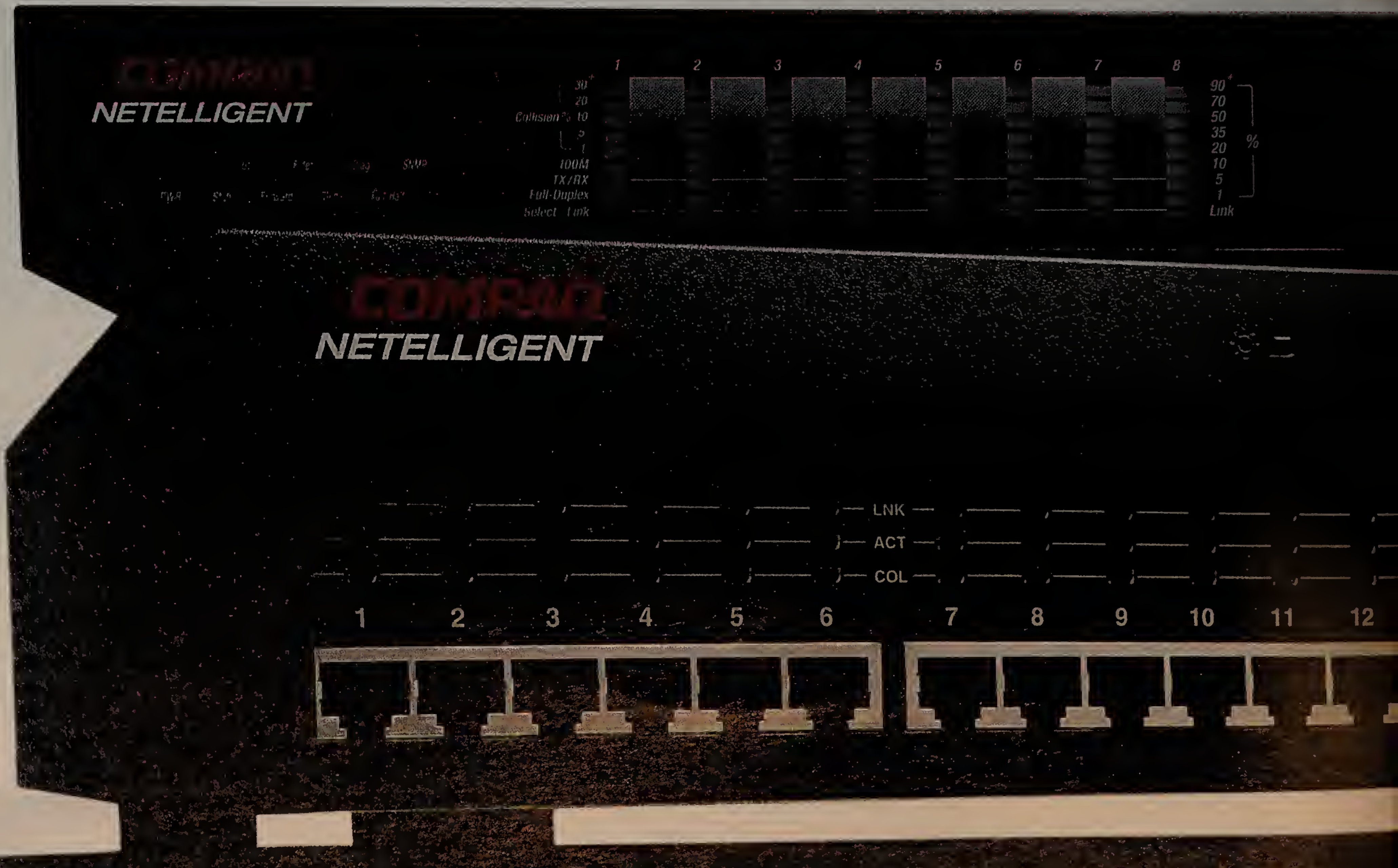

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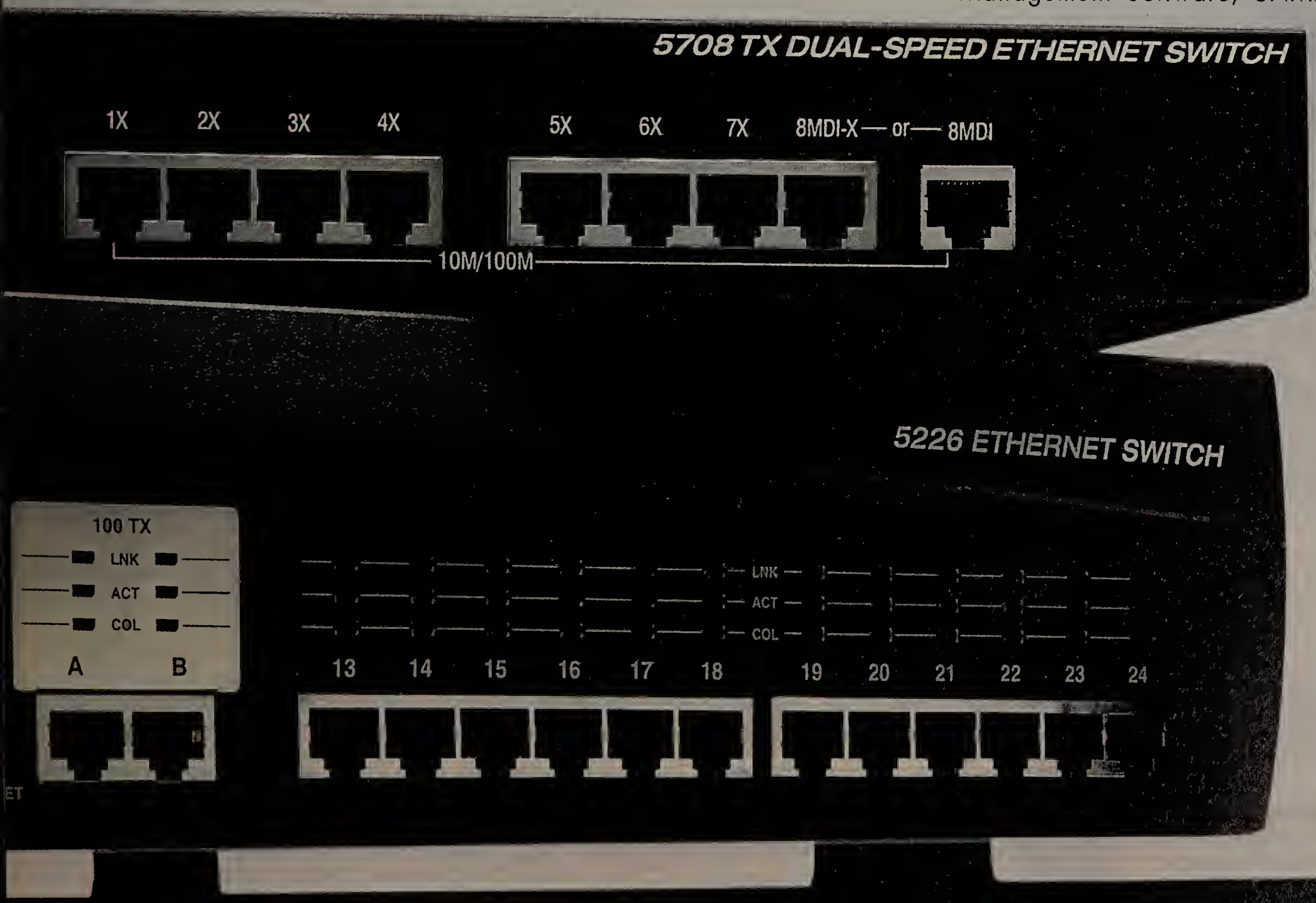

COMPAQ

Vendors air combination Web browser and phone

Alcatel, Nortel and Samsung ready $500 Webphone, an alternative to desktop PCs.

STEVE BORNS

Samsung's *Webphone*

By Ellen Messmer
New York

With a phone and computer firmly ensconced on your desktop, is there any room for a new device called the Webphone? The Webphone lets you make standard circuit-switched voice calls and access Internet services at the same time.

Alcatel Data Networks, Inc., Northern Telecom, Inc. and Samsung Electronics Company, Inc. are betting that businesses and consumers will open their pocketbooks for the Web phone. The device is a $500 screen-based phone with a keyboard that simplifies access to services by always being "on" to notify the user that e-mail or voice- and data-conference calls are waiting.

Alcatel's version of the Webphone, expected to ship by early next year, provides the user with a unified mailbox for voice mail, e-mail and fax messages, said Patrick Liot, Alcatel's vice president of communications terminals. The device also has a smart card reader to process cards bearing public-key certificates or other identification, said Liot, who trotted out Alcatel's entry in the race last week during the Java Internet Business Expo here.

With the full-screen Webphone supporting HTTP, HTML, the Java Virtual Machine and TCP/IP, "you just push a button to be on the Web," Liot said.

The Nortel product "is a business device that gets you the corporate directory or e-mail at a touch," said Ian Sugarboard, Nortel's vice president of business development. "Consumers could scroll bank balances or look at electronic catalogs." The Webphones also can display real-time financial or news updates.

Samsung's version of a Webtop handset represents "a way to adapt multimedia data to the phone for image and videoconferencing," said In Ryu, vice president of Samsung's software center in its coporate technical operations division.

The Webphones rely on dual lines or Basic Rate Interface ISDN, and three manufacturers expect to have wireless Webphones out sometime next year. Lucent Technologies, Inc.'s Inferno Network Software Solutions division, now set to be purchased by Phillips, is also at work on its own brand of Webphones.

Will organizations see Webphones as an inexpensive alternative to desktop PCs?

"We're looking at them for distance education and for administrative services," said Guy Morazin, executive director at the Ontario College Application Service, which processes student applications and confirmations on behalf of 25 Ontario colleges. The colleges are converting their current platform-dependent client/server applications to platform-independent Java. The Java-based Webphones might be a good fit in the colleges' server-based Java environment.

However, to develop a potential new array of electronic commerce services based on push technologies, Webphone manufacturers will need the help of Java software developers, Internet service providers and telephone companies. So far, there have been no takers.

Nortel's senior manager for business develoment, Jack Roehrig, acknowledged the $500 Webphone may be priced too high. He also said the discussions so far with telcos and ISPs about distributing the Webphone or providing new services to support it have been mixed.

The Webphone "carries the perception it should be [a] very low-cost device," said Roehrig, admitting that Nortel's internal research shows users expect it to cost around $100. ■

"The Webphone is an Internet phone for transactions, Web access, online services, home banking, e-mail, help desk and a new class of services we haven't even imagined yet."

Patrick Liot, vice president of communications terminals, Alcatel

STEVE BORNS

Sun, IBM and Netscape form Java alliance

By Ellen Messmer
New York

Sun Microsystems, Inc., IBM and Netscape Communications Corp. last week joined together to speed development and ensure common implementations of Java applications.

Specifically, the companies said they will combine engineering resources to "retune" the class libraries in Java Development Kit (JDK) 1.1. The idea is to make sure Java applications will not suffer from differences in look and feel that sometimes result when a Java application runs across different computer platforms.

The JDK 1.1, released last February, is the most recent version of the Java technology that Sun licenses to the industry. The JDK contains a core set of APIs, programming tools, a compiler and debugger.

"We're hammering a nail that's sticking up," said Scott McNealy, Sun chairman and CEO, last week at the Java Internet Business Expo here.

The retuning effort will be done at what Sun calls the Java Tuning and Porting Center. The new center will be based at JavaSoft in Cupertino, Calif.

"For every new release of Java, we want to port it everywhere — to browsers and computers — all at the same time," McNealy said.

"This is not a 'kitchen cabinet' that's going to define the [Java] strategy," said Netscape President and CEO Jim Barksdale. "It's about getting the latest JDK out there, fast, with a common source base."

This Java alliance also plans to fine-tune another work in progress, the JDK 1.2, by the middle of next year. The JDK 1.2 is expected to add new multimedia and security services to Java.

Some vendors welcomed the announcement of the Java tuning center. "The issue is making sure everything is in sync so there will be support in the browser," said Shaun Maine, chief technology officer at Sanga International, Inc. Sanga is building modular Java applications now being deployed through the Ontario University system. Maine noted that only Sun's own HotJava browser, written in Java, supports the JDK 1.1 at 100%. ■

STEVE BORNS

Sun's Scott McNealy, Netscape's Jim Barksdale and IBM's John Thompson *at JIBE '97 last week decided to work together to ensure Java's standardization.*

Vendors push for 'Net replication standard

By Chris Nerney
New York

Push technology vendor Marimba, Inc. and several other companies last week submitted a standard proposal for replication to the World Wide Web Consortium (W3C) designed to relieve Internet congestion.

The Distribution and Replication Protocol (DRP), jointly submitted by Marimba, Sun Microsystems, Inc., Netscape Communications Corp., Novell, Inc. and others, conserves bandwidth and keeps track of software versions when updating content, data or applications over the Internet.

But whether DRP becomes a standard may depend more on the courts than the W3C because of a patent-infringement lawsuit Novadigm, Inc. slapped on Marimba in March.

Novadigm CEO Albion Fitzgerald last week said the Marimba standard proposal was "a calculated, exploitative move" designed to rob Novadigm of its intellectual property rights. DRP is clearly based on "fractional differencing processes" patented in December by Novadigm, Fitzgerald said. The technology pitched to the W3C by Marimba is designed to help Internet service providers and their customers establish mirror sites on the 'Net that can systematically replicate data.

Marimba, which announced the standards proposal at last week's Java Internet Business Expo here, responded in a statement that Novadigm's lawsuit is without merit. Representatives from the W3C declined to comment on what course of action the standards organization will take. But a spokeswoman said the legal issues involved present an "unprecedented" situation for the W3C. ■

Go online for details of Novadigm's suit against Marimba over alleged push technology patent infringement.

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Web conferencing services debut

ConferTech to go head-to-head with MCI with Web-based collaboration package.

By David Rohde
Westminster, Colo.

A provider of voice- and data-conferencing services is betting that the World Wide Web can help users more effectively deploy electronic document sharing.

ConferTech International, Inc. early this month is expected to announce its ConferTech Web Conference service. The new service, which the company has been quietly testing for several months, enables up to 50 users to simultaneously view a document presentation over the Internet.

ConferTech Web Conference is designed to reduce the software installation and configuration usually required for wide-area data conferencing. Only the presenter needs special document-conferencing software — DataBeam Corp.'s FarSite running on Windows 3.1 or 95. Other participants simply use their browsers to enter the conference via a registration routine on ConferTech's Web site.

The service is not designed for full-scale data collaboration. Only the presenter can change and manipulate the documents. Other participants can only watch. But the service does include a simultaneous audio-conference over ordinary telephone lines, with the ability for participants to queue to ask questions.

"It's just like you're in an auditorium," said ConferTech marketing director Ed Tauer.

ConferTech is expected to go head to head against MCI Communications Corp.'s recently launched Web conference service. Like MCI, ConferTech — itself a subsidiary of local and long-distance carrier Frontier Corp. — has previously promoted a service in which all participants must install software supporting the T.120 data-conferencing standard.

The Web service could prove beneficial for ConferTech user EMC Insurance, Inc. in Des Moines, Iowa. EMC is considering expanding data-conference applications beyond its branch offices to its independent agents, which are likely to have Web browsers but not specialized conferencing software.

"The insurance business is pretty paper-oriented," said Max LaBlanc, lead methods analyst for EMC. "[Document conferencing] gives us the ability to help train people on our forms." ■

WHAT YOU NEED AND WHAT IT COSTS

Requirements and fees for ConferTech Web Conference:

Presenter	Participants	Cost
DataBeam FarSite T.120 conferencing software	Netscape Navigator 3.0+ or Microsoft Internet Explorer 3.0+	55 cents per minute per participant for data and audio
20M bytes available disk space for FarSite	28.8K bit/sec or greater Internet access	Volume discounts available

SOURCE: CONFERTECH, WESTMINSTER, COLO.

Auto-Tech 97

Automotive extranet sets rules, hires its own enforcer

By Denise Pappalardo
Detroit

How can you get your Internet service provider to support an extranet service that will guarantee throughput, minimal packet loss and network availability? Gather up your industry cohorts, tell the ISPs what you want, and hire a watch dog to keep them in line.

Last week, the Automotive Industry Action Group (AIAG) officially named Bellcore as the third party that will monitor its extranet network, the Automotive Network Exchange (ANX).

The ANX will be the world's largest industrywide extranet and will link thousands of companies.

Bellcore will certify ISPs to offer ANX services and will monitor the overall network. The ANX will link General Motors Corp., Chrysler Corp. and Ford Motor Co. with more than 10,000 suppliers when it goes online in January.

The network has been in development since 1995. It was demonstrated for the first time last week here at Auto-Tech 97 with the help of EDS Corp., Bell Canada, MCI Communications Corp. and Ameritech Corp.

Because of the Internet's soiled reputation for unreliable and unpredictable network delays and failures, the AIAG laid out very specific requirements for its network.

Before an ISP can become a certified ISP (CSP) it will have to meet standards that are unheard of in the world of Internet services today. The details of the requirements — ranging from maximum allowable file transfer delays to help desk availability — are spelled out in an AIAG document that was made available in June.

> *Before an ISP can become a certified ISP (CSP) it will have to meet standards that are unheard of in the world of Internet services today.*

Here is a sample of the guarantees CSPs will have to offer before Bellcore will give them the ANX seal of approval:

- Greater than 50% of raw bandwidth acting as actual throughput, which varies depending on the type of connection (ATM, frame relay, private line).
- Fewer than three packets lost for every 10,000 transmitted.
- Delays of less than 125 msec between CSP networks, network edge to network edge.

Pass or fail?

It has been difficult for other ISPs to support more detailed service level agreements, raising questions as to how others will be able to pass ANX's test come Jan-

See ANX, *page 14*

Adtran readies switch for enterprise access

By Tim Greene
Huntsville, Ala.

Adtran, Inc. will introduce next month at NetWorld+Interop in Atlanta a versatile and inexpensive switch that handles corporate local- and wide-area traffic.

The Adtran TotaL Access System (ATLAS) 800, switches packet and circuit traffic, giving users the option of integrating voice, video and data traffic in one box.

The device, with a 92M bit/sec backplane and eight slots, can switch traffic among as many as 34 T-1 circuits, or act as a T-1 multiplexer or an ISDN access switch, depending on configuration.

Lawrence Halcomb, president of Richardson, Texas, systems integrator Netspan Corp., is using the ATLAS 800 at a central campus site to act as a digital cross-connect for about 65 T-1 lines.

In addition, the ATLAS 800 is taking in voice channels from several different T-1 lines and aggregating them onto a single T-1 that connects to a PBX. "The sort of functionality we're talking about is available in other products, but they are much more expensive," Halcomb said.

Halcomb also is using the ATLAS 800 to tie together T-1 lines that are using different types of T-1 signaling.

In addition, Halcomb said he is using the ATLAS 800 to support video system gear that uses ISDN signaling. The video gear is connected by a T-1 line to the ATLAS 800, then the signal is sent to a remote site on a part of a T-1. "This was the only switch I found that could do that," he said.

The box also can overbook Primary Rate Interface ISDN WAN circuits to save on monthly line costs.

For example, corporate users of ISDN videoconferencing probably would not all want to use it at the same time. So the network manager could configure ATLAS 800 to overbook a PRI ISDN port with more than the 23 ISDN B channels a PRI can handle.

The ATLAS 800 also can switch ISDN Basic Rate Interface calls locally, lightening the use of the wide-area ports.

The ATLAS 800 will ship in the fourth quarter. List price for the chassis is $4,795. The four-port T-1/PRI/DSX module costs $2,795; the eight-port BRI ISDN module costs $3,200, and the four-port Nx56/64 module costs $2,295.

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ANX

Continued from page 12

nary, noted Rebecca Wetzel, director of Internet services at TeleChoice, Inc., a Verona, N.J.-based consulting firm.

For instance, late last year UUNET Technologies announced ExtraLink, its extranet service that includes 99.9% network performance and availability. However, the Fairfax, Va.-based ISP has failed to deliver on that promise to date. In fact, UUNET said the service will not roll out until October, almost nine months behind schedule. And the service will cost $100 to $200 more per dedicated connection.

"UUNET's situation is an indication of the difficulty involved in supporting these types of guarantees," Wetzel said. The ISP maintains that there are not technical problems with the service, but scalability issues.

Bell Canada, one of the ANX demonstration partners, is ready for the ANX, said Gregg Loos, associate director of electronic commerce at the Toronto carrier.

In fact, Bell Canada announced last week that it is working closely with Objective Systems Integrators, Inc. to meet the stringent requirements of the ANX.

So how will Bellcore ensure that Bell Canada and other potential CSPs are up to ANX snuff? While Bellcore will rely on the CSPs to provide it with some network data reports, it also will randomly test the CSPs' networks using its ANXO Performance Test Tool client server software package.

Lotta dough

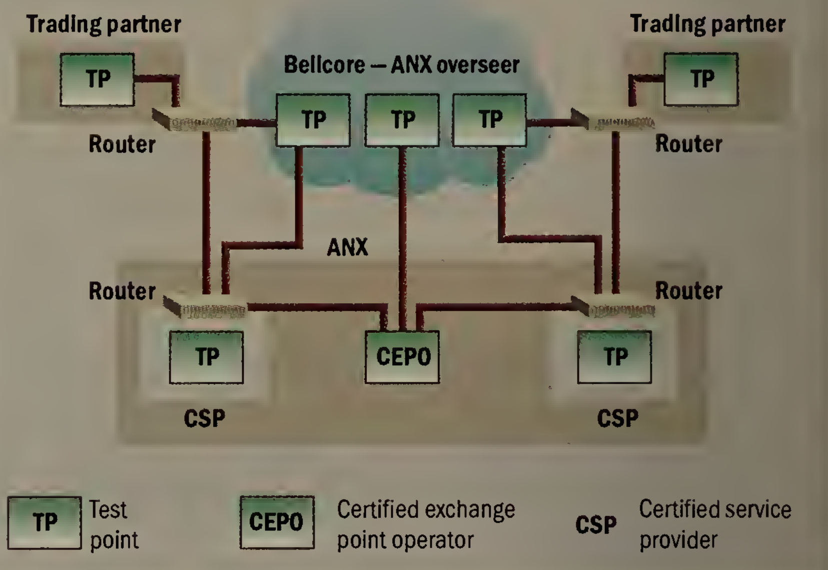
One thing to keep in mind is that the ANX's guarantees will not come to the automotive industry without a hefty price tag.

While the AIAG does not set service prices, the group believes a dedicated T-1, 1.544M bit/sec connection to the ANX network will cost 50% to 100% more than a typical T-1 from an average ISP. That translates to roughly $2,500 to $3,500 per T-1, per month.

Ford plans to support electronic data interchange and CAD file transfers as two of the first applications over the ANX, said Joe Boyd, telecommunications analyst at the company. ■

AUTOMOTIVE NETWORK EXCHANGE (ANX)

The ANX overseer, Bellcore, will be able to test and monitor performance, packet loss and delays from the certified service providers' networks to the trading partners. Bellcore will use a client/server measurement tool that will be deployed at test points throughout the ANX and at each of the trading partner's sites.



Design

Continued from page 1

shifting economics of local access are changing the game for carriers and users. As a result, some users are making crucial network design mistakes, while others are learning new new ways to help them get the most from frame relay.

Many users who have been told for years they can save money by minimizing the committed information rate (CIR) on their permanent virtual circuits (PVC) — because they can always burst traffic up to the port speed — now find they now have to reverse field.

For example, Robideux, information services manager for Miami-based distributor Southeast Frozen Foods, Inc., wanted branch offices to be able to download a 20M-byte map file showing street routes throughout the Southeast.

Because the map file sits on a server attached to an IBM AS/400, the branches use a Perle Systems, Inc. communications controller and a frame relay access device to pull the files down.

When one of the branches recently launched the download via a 32K bit/sec virtual circuit terminating at a 56K bit/sec AT&T frame relay switch port, the network burst directly to the port speed and "just knocked the controller down," Robideux said.

"The whole idea of frame relay is that I should be able to burst up to that port speed," protested Robideux.

Well, maybe not — or at least not anymore, according to experts.

Failings

Many users fail to acknowledge the congestion messages that carrier frame nets send back to routers and frame relay access devices, said Tom Jenkins, a broadband consultant at TeleChoice, Inc., of Verona, N.J. As a result, users routinely set their own buffers at the maximum port speed rather than taking care to start throttling back traffic at the CIR level.

"It takes longer to retransmit something that's been dropped than to just go ahead and send the information at the CIR," Jenkins said.

Users, especially those with delay-sensitive traffic, should consider raising their presubscribed CIR levels, agreed Rick Malone, president of Vertical Systems Group, a market research firm in Dedham, Mass. Although carriers recently have been increasing their frame relay port prices, they have been reducing overall PVC prices and the increments to add extra CIR to each PVC. As a result, "CIR is very inexpensive," Malone said.

AT&T users should take special care, analysts warned. That is partly because AT&T is getting a disproportionate share of the current frame relay boom (see graphic).

With all that new traffic, AT&T's method of regulating bursting through its StrataCom BPX switches from Cisco Systems, Inc. comes more and more into play.

On AT&T's network, users with higher CIR not only get more of their traffic guaranteed transit through the cloud but also get higher priority over competing users with lower CIR when both have exceeded their CIR.

Lower CIR users can suffer a problem on the large number of AT&T frame relay switch ports that are oversubscribed, said an official with one vendor involved with WAN performance measurement. Those are ports where the aggregate capacity of the PVCs emanating from the port exceeds the actual speed of the port.

The 'flattop effect'

Reports on some AT&T PVCs are showing a "flattop effect," in which attempts at data bursts repeatedly rise up to the same throughput level — often right to the CIR, or just above — before falling back, he said.

"Unless it's attributable to a regular business cycle, a flattop effect indicates a bottleneck somewhere in the network," said the official, who asked not to be identified.

And even more oversubscribed ports may be taken up as users expand their frame relay nets to further and further outlying posts to avoid yet another problem: remote access tolls.

Thatcher, president of Tel-Con Associates, Inc., a telecom bill-auditing firm in Overland Park, Kan., noted a danger when companies use 800 service into a remote access server from branch offices thought too small to be put on a frame relay network.

One client doing this saw 800 usage soar from 100,000 minutes in November 1996 to 287,000 minutes in March 1997.

"People were staying on all day," Thatcher said. Yet many of the same applications could have been handled with half a dozen short daily dial-up sessions. Not only do a lot of employees think of 800 calls as "free," Thatcher explained, but nonusage-sensitive Internet access services have conditioned people to think of remote access to all data networks as free. Yet that is where Nebiker, director of network services for Telxon Corp. in Akron, Ohio, came up with a new solution.

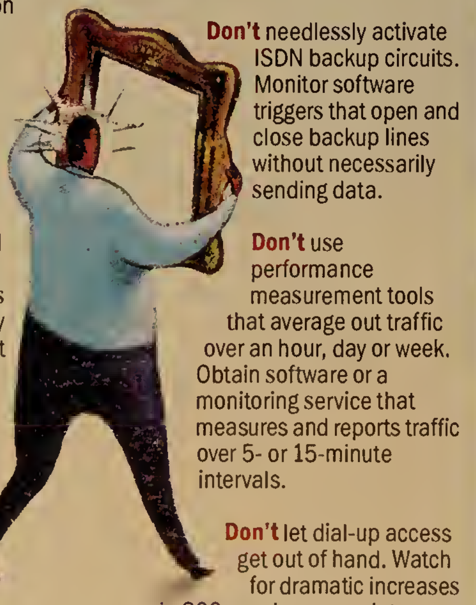
Telxon's branch office in Irvine, Calif., was using switched access to AT&T's Software Defined Network voice service and dial-up data access to headquarters instead of a direct frame relay connection.

In order to justify the cost of a T-1 line to the AT&T central office, he needed to demonstrate aggregate cost savings on voice and data networks.

Then AT&T suggested that Nebiker use the carrier's Digital Link service, which reroutes outbound local calls over a T-1 line to AT&T. That enabled him to rip out several hundred dollars a month worth of trunk charges to Pacific Bell, justifying a new 128K frame relay port and ending dial-up tolls.

Additional money-saving measures to counter the effect of new nodes and higher CIRs include the use of asymmetrical PVCs and careful monitoring of backup circuits. ■

FRAME RELAY DOS AND DON'TS



Do reassess your committed information rate (CIR). Bump it higher if necessary to guarantee throughput. To save money, consider asymmetrical permanent virtual circuits with lower CIRs in the direction away from most of the traffic flow.

Do consider moving smaller branch offices directly onto the network to slash remote access fees. Compare dedicated-access charges vs. dial-up tolls.

Do consider moving intra-LATA toll and local voice traffic onto the long-distance carrier's network, via services such as AT&T Digital Link, to help justify dedicated-access circuits. If confident in your local carrier's data services, consider reversing the process when it obtains long-distance authority.

Do watch for repeated "flattop" peaks in traffic at a consistent speed at or just above the CIR but below the port speed. Discuss with your carrier whether traffic buffered in its switch is leading to increased latency and sluggish bursts.

Don't fall in love with your port speed. Many ports are oversubscribed; bursting all the way to the port speed may become more difficult.

Don't needlessly activate ISDN backup circuits. Monitor software triggers that open and close backup lines without necessarily sending data.

Don't use performance measurement tools that average out traffic over an hour, day or week. Obtain software or a monitoring service that measures and reports traffic over 5- or 15-minute intervals.

Don't let dial-up access get out of hand. Watch for dramatic increases in 800-number usage into remote access servers.

Juniper attracts big money

Start-up wooed by an impressive list of networking elite.

By Tim Greene

Mountain View, Calif.

Superfast router firm Juniper Networks, Inc. last week received $40 million in new financing — a startling amount for a start-up.

But the list of investors was even more impressive.

3Com Corp., Ericsson, Lucent Technologies, Inc., Northern Telecom, Inc., an alliance of Siemens AG and Newbridge Networks, Inc., and UUNET Technologies all kicked in funds.

PROFILE: JUNIPER NETWORKS, INC.

Based:	Mountain View, Calif.
Founded:	February 1996
Funding:	$40 million from 3Com, Lucent, Ericsson, Nortel, Siemens/Newbridge, UUNET; $16 million earlier from Kleiner Perkins Caufield and Byers, CrossPoint Venture Partners and others
Personnel:	Chairman and CEO Scott Kriens, founder of StrataCom; CFO Marcel Gani, former vice president and CFO of Grand Junction Networks; Vice President of Engineering Peter Wexler, former vice president of engineering at Bay; Vice President of Sales Steven Haley, former vice president of sales at Cisco and StrataCom
Product:	Next-generation router for Internet

Juniper's goals are as big as its new bank account. Its router, developed exclusively for carriers and Internet service providers, is designed to eliminate the bottlenecks that have many doubting the long-term reliability of the Internet.

Juniper's plan is to speed up routers so they can pump out packets at the blazing speeds at which they travel over fiber-optic backbones. According to analysts, fiber can handle much more traffic, but today's routers cannot.

"These devices can't switch fast enough to keep the output pipe filled," said Tom Nolle, president of CIMI Corp., a technology assessment firm in Voorhees, N.J.

At the same time, Juniper is developing policy management software so ISPs and carriers can offer different levels of service quality across IP networks. Other network devices would have to honor the same policy management protocols, so some Juniper technology would have to be built into third-party tools.

What's the attraction?

Part of the attraction for investors is the team running Juniper. That team includes StrataCom, Inc. founder Scott Kriens, current Juniper chairman and CEO, as well as a supporting cast from the upper echelons of Cisco Systems, Inc., Bay Networks, Inc., Intel Corp. and 3Com, observers said (see graphic).

The investments indicate more than just financial interest in Juniper, Kriens said. During the coming months, the investing companies will individually announce a variety of technology, distribution and product integration agreements, he said. "[The investors] are more or less versed in different aspects of the network — data vs. voice and packet vs. circuits," said Kriens.

Nortel, for example, hopes it can integrate Juniper routing technology into its hardware, according to Klaus Beuchner, Nortel's senior vice president of corporate strategies and alliances.

"We want a relationship with them that allows us access to elements of their technology to embed in our products. [Investing] seemed the best way to get it," said Beuchner.

None of the new investors has a development team working on a next-generation router, according to Don Miller, an analyst with Dataquest, Inc., of San Jose, Calif. ■

User Excellence Awards: Call for entries

N*etwork World's* User Excellence Awards honor the innovative and effective use of network technology to achieve corporate objectives. To win, tell us about your latest network project triumph in 750 words or less. Every entry should consist of three sections:

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- The technology case: Explain why you made the choices you did.
- Costs and benefits: Give specific figures that detail what your project cost and how it contributed to the bottom line.

We'll treat winners of this year's contest to an elegant dinner for up to 10 members of their staff. Winners also will be featured in the special year-end issue of *Network World* and honored in an awards ceremony at the ComNet conference in Washington, D.C., next year.

And anyone who submits an entry that addresses all three sections will receive a free *Network World* T-shirt.

E-mail your entry to excellence@nww.com, fax it to (508) 820-1103, or use our Web-based form (enter DocFinder number 3318 at the Fusion home page at www.nwfusion.com).

Entries must include your name, title, company name, address and phone number. Please note: Entries will be accepted only from user organizations; no vendors or consultants, please.

The entry deadline has been extended to **Sept. 8, 1997.**

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Local Networks

Covering: LAN Hubs, Switches, and Management • Operating Systems • Servers • Thin Clients

Briefs

■ **Hewlett-Packard Co.** *last week bolstered its AdvanceStack family of stackable devices with a* **12-port 100Base-T hub.** *The workgroup hub can be stacked up to five units high. It includes expansion slots for HP's switch port modules, which allow customers to extend the 100Base-T connectivity distances up to two kilometers.*

HP's *12-port 100Base-T hub*

The hub, priced starting at $1,149, will ship in September.

© HP: (800) 533-1333

■ **Novell, Inc.** *last week announced pricing and availability of its new* **BorderManager** *suite of proxy, firewall, routing and virtual private network services.*

*The product, which has received high praise from early beta testers (*NW, *Aug. 11, page 1), is available through Novell's channel partners now.*

Pricing is based on concurrent users and ranges from $2,495 for a five-user license to $76,995 for a 5,000-user package. Customers can pick up BorderManager add-on kits for $1,995 per server. These allow customers to distribute services across sites.

© Novell: (800) 453-1267

■ **Bay Networks, Inc.** *last week announced four* **shared-media modules** *that add 10M/100M bit/sec autosense capabilities to the System 5000 chassis.*

The offerings include two 10M/100M bit/sec shared-media host modules, a network management module and a data collection module (DCM).

The modules will ship by November and range in price from $2,995 for the DCM to $6,995 for the net management offering.

© Bay: (800) 822-9638

SMP Systems

Microsoft and NEC join to bulk up NT servers

NEC readying two new Express servers.

By Rob Guth
Tokyo

Microsoft Corp. and NEC Corp. last week announced a partnership under which they hope to make Windows NT a better fit for corporate networks by improving its scalability and reliability. "NEC is helping us determine exactly what we can do with Windows NT," said Microsoft CEO Bill Gates.

This includes drawing from NEC's experience in building symmetric multiprocessor systems, Gates said.

The alliance is the latest step in Microsoft's quest to evolve Windows NT into a more robust platform that can better meet the needs of large corporate clients, analysts said. Microsoft, with a slew of partners, made a lot of noise earlier this year at Scalability Day, an event that highlighted NT's ability to run on multiprocessor machines.

For NEC, teaming with Microsoft is part of a long-term plan to migrate NEC's core mainframe technologies to low-cost, Intel-based systems. NEC hopes such a strategy will bring the company success in the PC server market.

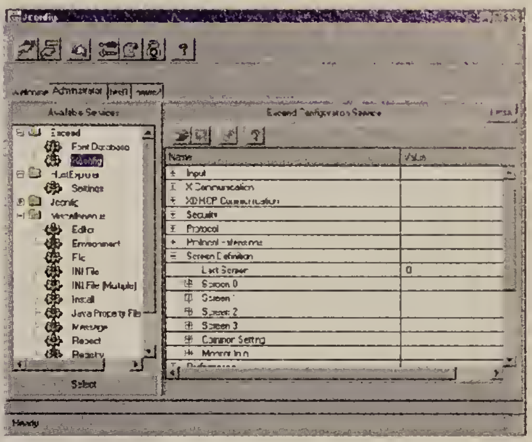
The alliance calls for Microsoft to support NEC's future development of two new servers for its existing Express family of Windows NT machines. Both servers will hit the worldwide market by the third quarter of 1998, according to Kazuhiko Kobayashi, associate senior vice president at NEC.

One of the new servers, code-named the Express Server for the Enterprise, is symmetric multiprocessing-based and aimed at large organizations. NEC will offer eight- and 16-processor versions of the server, which also will support Microsoft's clustering technology, formerly known as Wolfpack. The majority of NT servers available in today's market support a maximum of four processors.

The Express Server for the Enterprise will incorporate Virtual Interconnect Architecture (VIA), a clustering technology first detailed in April by Intel Corp., Microsoft and Compaq Computer Corp. The vendors claim VIA will speed data transfer over large clusters.

The second new server, code-named the Express Network Server, will be aimed at small and midsize businesses. The server will come with Microsoft's BackOffice suite preinstalled, Kobayashi said.

The Express Network Server will use Intelligent I/O, an emerging technology being pushed by Intel that reduces I/O demands on processors and streamlines data transfer rates across a network. The technology is expected to appear later this year, NEC officials said.



NEC is prepping *high- and low-end additions to its Express line of servers that will showcase new NT scalability features.*

Additionally, the agreement states that Microsoft and NEC will work together to offer users joint worldwide service and support. The partners also will establish a new engineering center to be located at Microsoft's Redmond, Wash., headquarters.

Guth is a correspondent with IDG News Service's Tokyo bureau.

Cabletron fills gap between hubs, high-speed switches

By Jodi Daniels
Rochester, N.H.

Cabletron Systems, Inc. last week rolled out a family of products that will help customers migrate from shared-access hubs to high-speed LAN switches.

The company's new MicroLAN devices help customers gradually make the move to switching by segmenting users into small shared workgroups linked by a 10M/100M bit/sec internal switch fabric.

All four new MicroLAN family members — two stand-alone devices and a pair of modules for the SmartSwitch 6000 — support 48 Ethernet or Fast Ethernet ports, with users segmented into four separate groups of as many as 12 users each. Up to 240 10M or 100M bit/sec ports can be supported in a single 6000 wiring closet chassis.

The Application Specific Integrated Circuit (ASIC)-based devices deliver more than 400,000 packet/sec of throughput and can support as many as four virtual LANs.

CABLETRON'S NEW MICROLAN SMARTSWITCH DEVICES

- Support 48 Ethernet or Fast Ethernet ports
- Offer Fast Ethernet, ATM, FDDI or frame relay uplinks
- Support all nine RMON groups
- Cost between $5,495 and $9,995
- Will ship by November

A highlight of the announcement was Cabletron's autonegotiating Fast Ethernet product — the Fast Ethernet MicroLAN module — that allows customers to use the same device to migrate from Ethernet to Fast Ethernet. Typically, shared devices support a single speed, according to Eric Blonda, product marketing manager at Cabletron.

"This takes advantage of all those 10/100 [network interface cards] out there by allowing users to attach to the repeater at either Ethernet or Fast Ethernet speeds," Blonda said.

Cabletron also offered an all-Ethernet version of the 6000 module.

For the desktop and workgroup environments, Cabletron rolled out the SmartSwitch 2110 Fast Ethernet device and the 2100 Ethernet box.

The MicroLAN products offer customers a less expensive alternative to providing dedicated switch connections to every desktop.

"Once customers are hit with the sticker shock of full-blown switching, they often want a solution that combines shared and switched media products," Blonda said. "A switched solution can cost more than double that of a shared one."

All four products can be managed via any SNMP-based management platform.

Pricing for the Fast Ethernet MicroLAN module is $9,995; the MicroLAN 2110 stand-alone device costs $8,495. Both will be available in November. The Ethernet MicroLAN module is priced at $5,995, and the MicroLAN 2100 stand-alone box costs $5,495. They are shipping now.

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- A look at switching's dark side
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Vendors put Java face on PC-to-Unix applications

By Christine Burns and John Cox

Two software vendors have taken different approaches to letting users access Unix-based applications via Internet technology: One is sticking with traditional Windows PCs, while the other is embracing thin clients.

Hummingbird Communications, Inc. has retooled its PC X Server to work as a plug-in to popular Web browsers running on Windows PCs. Separately, GraphOn Corp. has rewritten its streamlined X Windows software in Java so it can be downloaded from a server to run on a network computer.

An X Windows Server is a program that lets a desktop computer display applications that actually run on a remote Unix server.

Hummingbird, which last year grabbed 54% of the X Windows Server market, this week will release Exceed 6.0, which supports the Web-enabled Broadway technology outlined in the latest industry-standard X Windows Server X11RS6.3 specification.

As a result, Exceed 6.0 can plug into Netscape Communications Corp.'s Navigator and Communicator and Microsoft Corp.'s Internet Explorer 3.02, enabling end users to see Unix application screens within the browser.

Hummingbird customers said a Web-enabled Exceed product — as opposed to one written completely in Java — is what they need at this point.

The new version of Exceed fits nicely into the Windows-based office automation package that runs on most desktops at NASA's Lewis Research Center in Cleveland, said Les Farkas, a network engineer at the center.

"I don't see the need to swap out what I have in favor of a purely Java-based scheme when it's not really clear yet what that gets me," he said.

A Java version of Exceed will be delivered in the future, according to Hummingbird officials.

Hummingbird also has added to Exceed 6.0 a tool called Jconfig that lets administrators configure, customize and manage Hummingbird's PC-to-host connectivity software from any Java-enabled browser or management console.

See **Java Face,** ***page 19***

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Digital polishes ClearVisn product

By Jim Duffy

Maynard, Mass.

Digital Equipment Corp. last week unveiled a new version of its network management software that enhances users' ability to establish policies for automated management.

Version 2.0 of Digital's ClearVisn software runs on Windows, Windows NT and Unix systems, and manages Digital's switches and routers. Like ClearVisn 1.0, the new software enables users to define management policies by which agents and applications react and respond to network anomalies.

But ClearVisn 2.0 takes this approach one step further by supporting a new fault-management application and extending the capabilities of existing virtual LAN, Remote Monitoring (RMON) and intranet management applications.

Digital's Fault Policy Manager provides a graphical user interface (GUI) for setting thresholds for RMON alarms and events. Users can set policies by which agents on Digital network devices self-monitor performance and traffic parameters.

When these thresholds are reached, ClearVisn launches automated responses, such as invoking an application to modify the network's configuration or notifying a network manager via e-mail or a pager.

"We run a lot of frame relay here, and we don't have a lot of 'hands-on' on the network like we had before. So we really don't know if we're having any kind of difficulty with the frame cloud or not," said Bob Wycoff, network administrator at the State of Colorado's Department of Transportation. "This helps us isolate things."

However, Wycoff said he would like to see Digital make ClearVisn's database update capability more flexible and improve the product's ease of use. "You've got to really sit down with the books and read them before you can [use it]," he said.

The VLAN plan

Digital has added a "wizard" to the product's VLAN Manager application GUI that helps users create port-based VLANs.

Digital also has added support for LAN Emulation in the applications, which allows users to configure VLANs and emulated LANs with their own ATM switches.

In addition, Digital has added support for Fast Ethernet switches in ClearVisn 2.0's RMON Manager application. The enhancement helps users collect, view and analyze RMON-based statistics from Fast Ethernet hubs and switches.

WHAT'S NEW WITH CLEARVISION 2.0

- Fault Policy Manager interface for setting RMON alarms and events
- New wizard application for creating port-based VLANs
- Support for Fast Ethernet switches
- Extended Intranet Manager tool for monitoring ISP or carrier services

Finally, Digital has extended ClearVisn 2.0's Intranet Manager so users can view service levels provided by their WAN service provider or carrier.

With this enhancement, users can monitor the performance of network circuits and get fault notification to determine if they are receiving guaranteed response time from their service providers.

ClearVisn 2.0 is priced from $945 to $16,995. It will ship this month.

© Digital: (800) 344-4825

WIRED WINDOWS

A new meaning for Labor Day

Dave Kearns

Back when I was a network administrator, I always thought Labor Day was aptly named. It was one day you could be sure to find me laboring away trying to finish one upgrade or another before the hordes descended on Tuesday, tanned, buffed and ready to blame IS for the delay in getting their summer project out the door.

This Labor Day, though, could be the last one like that for many of you. Maybe not next year, but the year after, you'll be able to spend the long weekend on your boat or at the lake — wherever you choose to spend your increasingly available nonworking hours.

Now before you turn the page thinking Old Dave got into some bad hamburger at the cookout, let me explain. The best emerging technologies this year are automatic, or semiautomatic, software upgrades. I've mentioned CyberMedia's Oil Change before (*NW*, July 8, 1996, page 22). It keeps you notified of updates available for the software you have installed, tracks the revision level of your products and, at your option, automatically downloads and installs the updates for you.

CyberMedia now has competition in the form of Cirrus Arts' Versions, which promises to track 20,000 commercial and 20,000 shareware applications for you. Versions doesn't have Oil Change's autodiscovery. In fact, there's no client-side software at all.

Once you've subscribed to Versions ($12 per year), you head over to the company's Web site (www.versions.com/) and register all of your software.

Neither company is resting on its laurels. CyberMedia is rolling out an Enterprise server version of Oil Change that will let you store the updates you need locally, then push them out to the desktops according to your schedule. Cirrus Arts is about to announce the ability to handle online purchases — as well as deliveries and updates — of commercial product upgrades.

Expect more features to be coming, because the interest in these utilities has attracted the attention of the red-eyed monster from Redmond. Windows 98 and Windows NT 5.0 will include a new operating system utility to handle updates automatically. It will track your installed version, download updates from Microsoft Internet sites and install the changes. NT 5.0's Active Directory even is supposed to let you roll out changes across your network.

So by Labor Day 2000, you'll be able to lie back and relax while the automated updates do their work. Should anything go wrong, your system will page you. You fire up your handheld net terminal, dial up a local Internet service provider (or plug into your hotel's T-1 connection), log on over the virtual private network, examine the update logs and either schedule the corrections or roll it back entirely.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of the week

I recently wrote about Wilson WindowWares' WinBatch Windows scripting utility. Reader Bob Byers wrote to further extoll the product's virtues while lamenting its biggest deficit — the lack of scheduling tools. He said he's using Metz Software's Metz Scheduler (www.metz.com) and WinBatch to approximate the Unix CRON function. If the $29-per-desktop price of Metz Scheduler puts you off, there's also a Task Scheduler utility that comes as part of Microsoft's Internet Explorer 4.0.

Java Face

Continued from page 18

Exceed 6.0 runs on Windows PCs and costs $545 per client.

GO-Joe

GraphOn, based in Campbell, Calif., is offering customers a more radical choice: GO-Joe, which is a Java version of GraphOn's X Windows software. The new software is designed for downloading by network computers, which then display screens from applications running on Unix servers.

GO-Joe uses GraphOn's RapidX protocol, which is a streamlined version of the standard X Windows protocol. RapidX runs much faster than X Windows because GraphOn eliminated much of the back-and-forth chattiness that characterizes X Windows, said Wayne Thompson, GraphOn's director of sales engineering.

RapidX runs over Unix socket connections, but GraphOn plans to support other transport protocols in the future, including the Object Management Group's Internet Inter-ORB Protocol.

One GO-Joe beta site is Sun Microsystems, Inc., which is replacing Unix workstations and PCs with its own network computer — the JavaStation. Sun is using GO-Joe to give end users access to nearly 300 Unix business applications.

"The whole thing has been very easy to bring up and manage," said Howard Pelling, Java architect for Sun's Information Resources group. "To us, GO-Joe is just another application — one that lets you access your existing [Unix] applications."

GO-Joe was released last week for general beta test.

It can be downloaded from www.graphon.com and will be generally available by the end of this month.

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NUMA steps into the spotlight

By Marc Songini

There's nothing like the signing of a $59 million contract to give an emerging technology a boost.

The Boeing Co. signed such a contract with Sequent Computer Systems, Inc. earlier this summer to buy Non-Uniform Memory Access (NUMA)-based servers and related services — a deal that cast NUMA server technology into the spotlight.

The airplane maker plans to move core applications from mainframes to Sequent's NUMA-Q 2000 servers. Because they are based on NUMA, the Sequent servers boast greater scalability and processing speed than traditional symmetrical multiprocessor (SMP) systems. Boeing will deploy the systems as part of its Define and Control Airplane Configuration/ Manufacturing Resource Management project, which will give the company a single source of product data for each plane it makes.

"This new system will help us configure the airplanes, translate customer requirements into product decisions, build the products we've defined and support the plane in service," says Scott Griffin, a technology director at Boeing.

Boeing is not alone in embracing NUMA. Other users, such as the National Association of Securities Dealers, Inc. (NASD) and Millipore Corp. also have bought into the technology. These companies will use NUMA to handle processor-intensive applications such as data warehousing and transaction processing. And vendors such as Sequent, Data General Corp., Hewlett-Packard Co., Silicon Graphics, Inc. and Sun Microsystems, Inc. have either rolled out NUMA-based products or plan to do so.

"It's going to become a predominant architecture," said Christopher Willard, an analyst at International Data Corp., a Framingham, Mass., market research firm. "It's a good, scalable solution."

NUMA vs. SMP

So what exactly is NUMA? Basically, it's an evolution of SMP technology with a little clustering technology tossed in.

Like SMP machines, NUMA servers consist of multiple processors bundled together to achieve greater processing power. To date, most NUMA servers are comprised of four-processor configurations, sometimes called quads, placed on motherboards and united via high-speed interconnects, such as Sequent's 1G syte/sec IQ-Link.

NUMA: WAVE OF THE FUTURE

Users say Non-Uniform Memory Access:

- **Allows increased scalability**
- **Cuts management costs**
- **Speeds up operations**
- **Allows partitioning of functions**
- **Works with Symmetric multiprocessing applications**

The main difference between a NUMA setup and a traditional SMP setup is that each processor in a NUMA machine has access to its own local memory in addition to other processors' memories via point-to-point links, whereas processors in most SMP systems need to share a memory bus. This means that NUMA machines can be expanded by adding more processors. The problem with expanding with SMP machines is the more processors you have, the more congestion you get on the memory bus.

Most SMP machines max out at about 16 processors, but NUMA machines can grow and grow. Customers can cluster a pair of 16-processor SMP machines, but that tends to address availability more than scalability.

Meanwhile, Sequent claims a single NUMA server can scale up to 252 processors and handle 100 terabytes of information. The servers also can run a variety of applications and operating systems, including Unix and Windows NT.

Although some vendors have built Reduced Instruction Set Computing-based NUMA boxes, market front-runners Data General and Sequent are taking advantage of Intel Corp.'s less expensive Pentium Pro microprocessors. NUMA servers generally cost from $240,000 to $1 million, roughly the same as comparable SMP servers.

NUMA: AN ALTERNATIVE TO SMP

Data General's Aviion 20000 is the company's first Intel processor-based Non-Uniform Memory Access (NUMA) server. It is one of the only Intel-based NUMA servers on the market. Features include:

- **Motherboards that support four Pentium Pro processors**
- **I/O subsystem with 12 PCI slots**
- **512M bytes to 4G bytes of memory**
- **Hot swappable power**

Putting NUMA to use

While NUMA is a fairly new and untested server architecture, a growing number of customers are adopting it.

"I see [NUMA] as one of the waves of the future," says William Bone, vice president of strategic technology services for NASD in Washington, D.C.

NASD, which has 3,000 end users on its network, is transferring an Oracle Corp. database and mission-critical applications from 11 32-processor Sequent Symmetry servers to two 12-processor Sequent NUMA systems. The organization went with NUMA for its scalability and speed, Bone says.

"It's built to be a huge data warehouse," he says, referring to the NUMA machines.

Among the applications being moved to the NUMA servers is an artificial intelligence program that monitors stock market activity. Bone says that he has seen performance improvements.

The only downside is the organization has had to optimize its applications to run on the NUMA machines, something it did not have to do for the Symmetry boxes. Bone he says the Symmetry boxes now will be used for less important tasks.

Another user praised NUMA's speed. "We're finding things running several times faster than they did," says Mike Prince, chief information officer at Burlington Coat Factory in Burlington, N.J. Prince's department acquired three 12-processor Sequent NUMA systems earlier this year and has been migrating its data from six 14-processor Sequent SMP boxes.

"The retail business is information-intensive, and there are lots of transactions and information that need to be stored and digested," Prince says. Burlington needs a server that can run complex decision-support software and financial applications, and NUMA does it, he says.

One benefit of moving to NUMA is that the company now is using three NUMA systems instead of six SMP boxes, which simplifies server management.

The company's NUMA servers eventually will host applications accessible via network computers, Prince says.

Another customer, Millipore Corp., of Bedford, Mass., has also traded in a Sequent Symmetry server for a NUMA machine. Before the switch, there was a constant fight between batch users and online users for access to server resources, says Ron Hawkins, director of technology for Millipore, which sells water purification and filtration systems. Now the company is able to partition quads within the NUMA server to handle different sets of end users.

"NUMA has enabled us to favor online users over batch users, which is a big win for us," says Hawkins. "Online users are seeing much more consistency in response time." ■

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Internetworks

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Briefs

■ **Ariel Corp.** *last week announced the availability of* **RASCAL 1000,** *hardware modules that plug into PC-based network servers to convert them into remote access servers. A RASCAL unit consists of two ISA cards that support a T-1 or Primary Rate Interface ISDN line with 24 56K bit/sec modems. The cards reside in PC-based servers running Microsoft Corp.'s Windows NT Server. RASCAL 1000 can convert an NT LAN server into a full-featured remote access server. It costs $11,500 and is available now.*

Ariel's *RASCAL 1000 modules*

Ariel also recently announced T-1-Modem+, an ISA bus card for PC-based Unix or Windows NT remote access servers that supports up to 30 33.6K bit/sec modems. The T-1-Modem+ also comes in 12- and 24-modem versions. T-1-Modem+ is available immediately and costs $6,075 in quantities of 50.

✆ Ariel: (609) 860-2900

■ **VeriLink Corp.** *last week announced two single-port* **DSUs/CSUs** *designed for small sites that support frame relay, T-1 or fractional T-1 links. This is the initial offering in a line of gear called the C Series. C100 is a stand-alone box designed for point-to-point connections. The C150 has add/drop capabilities to support a channel bank or PBX. A third box, the C56, has an integrated DSU/CSU and support for 56K bit/sec links. The C56 Plus model also supports 64K bit/sec lines.*

The C100 starts at $950, and the C150 starts at $1,195. Both will be available this month. The C56 starts at $750, and the C56 Plus costs $1,195. They will be available sometime in the fourth quarter.

ISPs turn to Cisco for service-level monitoring

By Jim Duffy
San Francisco

Internet service providers are using Cisco Systems, Inc.'s NetFlow caching software to keep tabs on the levels of service they deliver to their customers.

More than a year ago, Cisco introduced NetFlow as a caching technique to speed packets through routers. NetFlow also collects statistics on IP packet flows.

Service providers can use these statistics to bill customers by usage, time, traffic volume, application, distance and quality of service (QoS) level. In addition, NetFlow software gives service providers the information they need for network planning and network and service management.

Digital Island, Inc., a Honolulu-based start-up company offering Web hosting, Internet access and multinational intranet services, uses NetFlow to document throughput levels for customers. This documentation is important because Digital Island's customers want to circumvent congested Internet network access points.

"We're one of the few [service providers] really relying on NetFlow to run an aspect of our business," said Dave Abbajay, director of network application services for Digital Island.

The Digital Island network is comprised of about 10 Cisco routers, including two Cisco 7206 models that are running NetFlow. NetFlow statistics are collected with home-grown Digital Island software and logged on an NT-based SQL database.

Digital Island also wrote software to generate Web-based NetFlow reports that can be viewed from any Web browser.

Cisco recently added its own data collection and Java-based analysis extensions to a new version of NetFlow. Also included in that release are scalable flow-cache management for large service provider networks with many data flows and sources and destination autonomous system number recording.

ISP ANS Communications, Inc. said the new NetFlow capabilities can reduce errors in capacity planning as well as human resources needed for interprovider traffic analysis and network security. The NetFlow extensions also can be useful for usage-based billing, ANS said.

ISP @Home Network said NetFlow can be used as the foundation for offering different levels of QoS as well as usage-sensitive billing. ■

BENEFITS OF NETFLOW TO SERVICE PROVIDERS

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- Proactive network monitoring and trouble resolution
- Tactical network engineering and strategic network planning
- Enhanced customer service via intimate knowledge of customer network and application usage patterns

SOURCE: CISCO SYSTEMS, SAN JOSE, CALIF.

CoreData pack backs up data, eases remote access mgmt.

RemoteWorx can reduce remote connect times.

By Tim Greene
Phoenix

CoreData, Inc. last week introduced software that makes it easier to manage remote clients and trim remote access costs by reducing dial-up connect time.

RemoteWorx Version 2 runs on Windows 95 and NT mobile clients. It enables central-site Windows NT servers to update their databases with changes to key files each time the remote user dials in. Updated files are stored on the central server in the event a remote laptop is lost or damaged.

In addition, the RemoteWorx intelligent agent inventories the hardware and software on the remote client. It then updates an asset database on the server with the changes that have been made since the last remote session.

Terry Kahler, vice president of client services for MicroAge, Inc., of Tempe, Ariz., said the software protects valuable data entered into laptops by his sales and operations staff.

If needed, the database for a given laptop can be downloaded to a replacement device for shipment to the remote user in the field, Kahler said.

The asset database keeps track of the status of each remote client's software and hardware, giving IS managers a running inventory of what is deployed in the field, information that usually is not available. "Typically, you'd be in the dark," Kahler said.

If left hooked up to a phone line, the remote RemoteWorx client can be set to synchronize data in the laptop with the server database while the remote user is asleep or not using the device.

When synching files, the client transmits only changes, not the entire files, reducing the traffic being sent and, therefore, the connect time.

The data sent from the clients also is compressed 75%, further reducing connect time.

With the initial release, RemoteWorx updates only from the client to the server. But within 90 days, the server version will be enhanced to update the client with changes that have been made at the central site.

For example, updated price lists could be downloaded to remote sales staff each time they dialed in.

The RemoteWorx client and server store each change and can reconstruct any previous version of a file as well as the current one, according to Gary Legner, vice president of sales for CoreData. Therefore, a salesman who changes a product presentation one day can easily go back to the previous version the next.

RemoteWorx can add a measure of security because each transmission is encrypted. And even if a transmission is intercepted and decrypted, the hacker would get only the most recent changes and would have no way of reconstructing the complete document, Legner said.

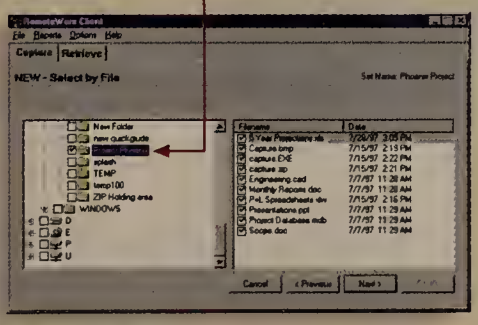
RemoteWorx 1.0, which preceded the latest version, was designed for LAN-based clients.

RemoteWorx 2.0 is available now. It has with a list price of $1,695 for a server and 10 clients. An additional 100 clients costs $12,900, and individual additional clients cost $149.

✆ CoreData: (888) 251-3282

RemoteWorx backs up laptop files

Laptop users click on directories they want saved to a central server. Later screens specify automatic or manual capture and schedule a time of day for synching files.



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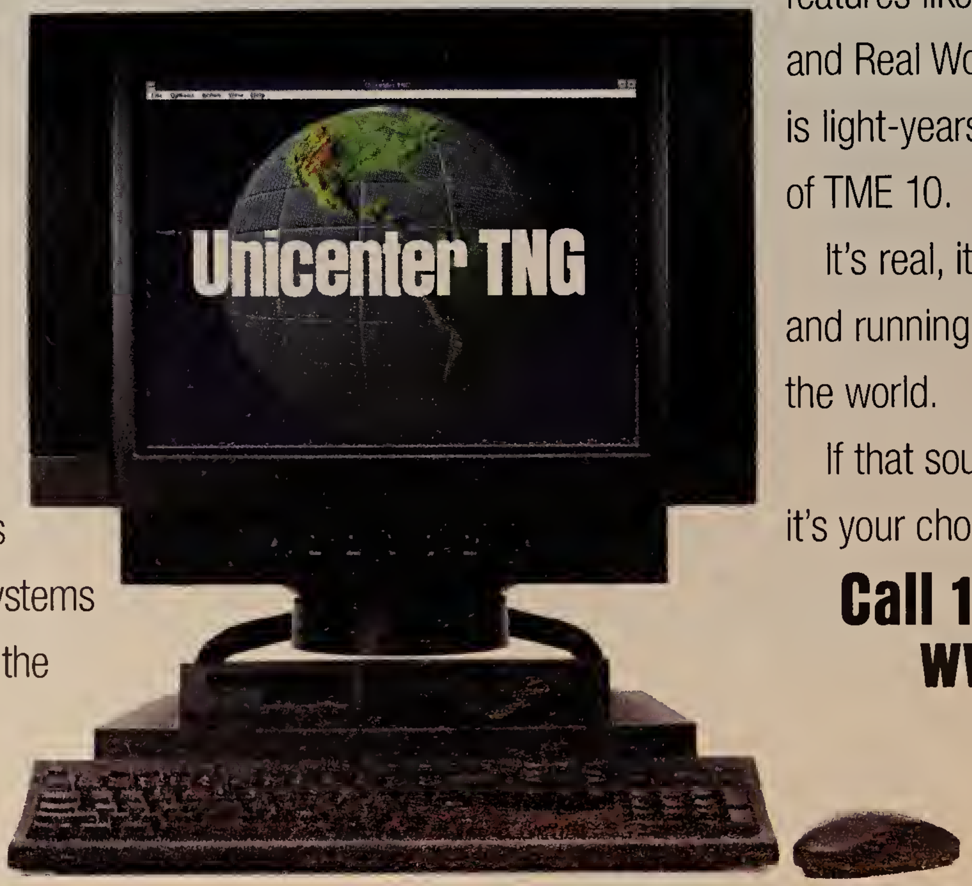

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INTERNETWORKING MONITOR

Token ring: Strategic once more

Take this column and show it to your boss. Point to the title and say: "See, token ring *is* strategic technology."

Who says? For starters, try 3Com, Bay, Cabletron, Cisco, IBM, Madge Networks, Olicom, Proteon and Xylan. They are the most well-known companies that have pledged support for an industry-standard High-Speed Token Ring initiative.

This occurred last week when The Tolly Group and *Network World* held our second Token Ring Futures roundtable in Boston.

In the two months since our first roundtable, many of the vendors have conducted extensive customer surveys. These survey results showed that even as a technology "without a future" some 50% of their existing customers had no intention of migrating from token ring. When queried about the possibility of a future-proof High-Speed Token Ring, interest was high.

The various vendors, now recognizing a clear need, are putting into motion one of the most aggressive standards and technology development processes ever seen in our industry.

The result will be a future as bright for token-ring users as that for Ethernet users — Gigabit and beyond.

Kevin Tolly

In a sort of manifesto agreed to by all in attendance (and printed elsewhere in this newspaper), the future was outlined as follows:

- Standards. Whatever emerges will be based on standards. Customers have made that clear to the various vendors, and the vendors have gotten the message. There will be no breakaway factions here. High-Speed Token Ring efforts will get under way immediately within the IEEE 802.5 token-ring committee.

Furthermore, to support customers whose needs include multitopology virtual LANs, the group agreed not to preclude the inclusion of 802.5 High-Speed Token Ring stations in any future 802.1q VLAN developments. It is unclear whether 802.1q and associated IEEE committees will be able to clear up certain technical problems, such as support for token ring's larger frame sizes, that currently, in effect, exclude token ring from participation in such environments.

- Speed. While the initial cut will be at a 100M bit/sec line rate standard, the real good news is that whatever the IEEE devises will be guaranteed to be scalable to one gigabit — or higher! Development of the gigabit standard will be done in parallel thus accelerating the process.
- High-speed desktops. The initial focus of 100M bit/sec token ring will be dedicated connections for server and switch products. With the proper drivers, this same technology could be used for the desktop.

What's next? Plenty. The IEEE 802.5 committee also coordinated its interim meeting in Boston last week. They are now in high gear. In addition, on Sept. 15, the High-Speed Token Ring Alliance will form and hold its first meeting in Real-time Transport Protocol.

And, come NetWorld+Interop in Las Vegas in May 1998, you'll see High-Speed Token Ring in action as the group promises technology demonstrations of 100M bit/sec token ring at that show.

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (732) 528-3300 or via the Internet at ktolly@tolly.com or www.tolly.com.

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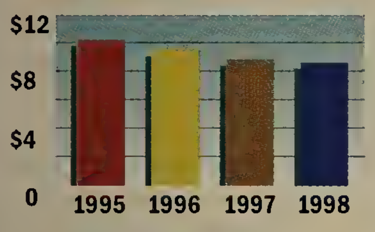
Briefs

■ **Paging carriers** *added* **8.6 million new subscribers** *last year, topping the previous record growth in 1995, according to the Strategis Group, a Washington, D.C. market research firm. The*

AVERAGE MONTHLY AMOUNT SPENT PER PAGER



SOURCE: STRATEGIS GROUP, WASHINGTON, D.C.

total customer base expanded by 25% to reach 43.1 million units in service by the end of 1996. But because of price competition, the average amount users spent per pager dropped to $9.77 per month, a downward trend that is expected to continue.

■ **Network Solutions, Inc. (NSI),** *the Herndon, Va., company that manages Internet domain name registration, is making efforts to* **increase the reliability of its WHOIS** *servers. WHOIS is NSI's database of domain names, essentially the electronic white pages of Internet networks. As the number of Internet users grows daily, so does the strain on NSI's servers. So NSI is now using Conxion Corp., a San Jose, Calif.-based Internet service provider, to host mirrored versions of its WHOIS servers.*

■ **MCI Communications Corp.** *began a trial of an optical cross-connect system along its Dallas fiber ring.*

MCI officials want to see if they can build an **all-optical network,** *eliminating the conversion of ultrahigh-speed optical signals to electronic signals at the point where traffic should be routed onto a different circuit. Such a system would help eliminate the need to restore DS-1 and DS-3 circuits one by one in case of an outage, MCI said.*

PSINet: Coming out of the red?

By Denise Pappalardo
Herndon, Va.

PSINet, Inc., one of the largest Internet service providers, has been fighting an uphill battle to become profitable and stable.

Like many of its competitors, PSINet has been trying to find the right mix of services, customers and opportunity in the Internet world that will bring its bottom line into the black. However, the ISP has made a variety of acquisitions and new deals, especially international ventures, that have not panned out.

The ISP's struggle has created doubt on Wall Street. But PSINet has focused on providing corporate business with Internet access services for the past nine to 10 months. The action is viewed by analysts as one of the more positive moves the company has made in the past year.

Just last week, PSINet added a twist to its business-user focus. While it has been offering wholesale services to smaller ISPs, PSINet is trying to drum up more revenue from its wholesale business. So it changed its peering policy and opened up its Internet backbone to all ISPs that want to peer regardless of size. The company made the move in the hopes that its sign of good faith now will bring more wholesale business later. For example, a small ISP may only want to peer today. In two years, it may be ready to buy network transit services from PSINet.

This is not the first time PSINet has tweaked its strategy to generate revenue and earnings for its stockholders. In fact, it has had an active history, including purchasing InterCon Systems Corp. to enter the software business; buying The Pipeline Network, a New York-based ISP, to focus on the consumer market; and announcing a joint venture with The Chatterjee Group to build a Pan-European network.

All three of these deals are now defunct. PSINet sold InterCon to Ascend Communications, Inc. in January and sold about 90,000 dial-up consumer accounts to MindSpring Enterprises, Inc. in September of last year. And there will be no PSINet Pan-European network with Chatterjee (see graphic).

"We successfully concluded the joint venture [with Chatterjee] by extracting ourselves from it," said PSINet CEO William Schrader.

Even though PSINet has thousands of business customers and offers competitive Internet services, including managed intranet, Web hosting and Internet faxing services, Wall Street is taking a cautious view of PSINet.

"The company failed to deliver on expectations that we allowed the market to expect from PSINet in '95 and '96, and now the Street doesn't believe that we will be able to deliver in '97 and '98," Schrader said.

"The company spread itself too thin from a management and capital perspective," said Steve Franco, analyst at Pacific Growth Equities, a San Francisco-based financial consulting firm.

"If [PSINet] didn't go after those markets [software and consumer services], they probably would be profitable right now," said Miles Russ, vice president at Wheat First Butcher Singer, Inc., a Richmond, Va.-based brokerage house.

Late last month, PSINet reported second-quarter revenue had jumped to $29.5 million, compared to $20.2 million for the same quarter last year. However, losses totaled $11.3 million compared to $10.9 million the same quarter last year.

Not only did the ISP report a loss, but it also reported that two more of its international deals went sour.

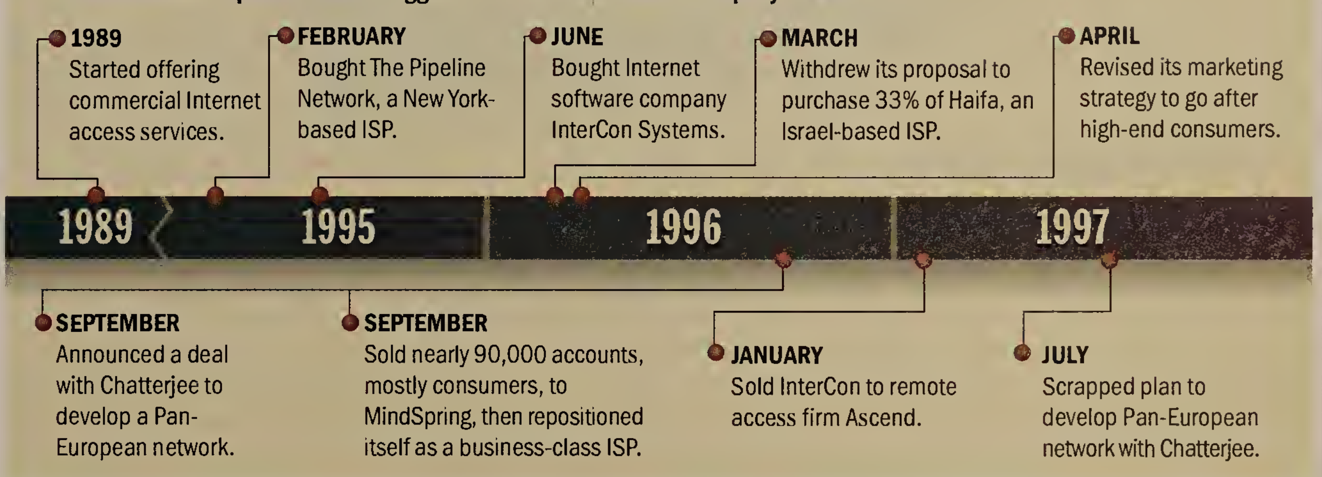
PSINet will not be rolling out Internet services in the Netherlands or South Korea as it had promised last year. Schrader basically chalked the aborted deals up to business strategy differences, but analysts did not seem concerned.

Despite the problems, analysts are optimistic about PSINet's future. "I would be surprised if [PSINet's] stock was trading for less than $10 a share in six months," Franco said. PSINet's stock has been trading at roughly $8.50 per share. And Wheat First Butcher Singer expects the ISP to break even this year and report profits by the

See **PSINet,** *page 32*

PSINET'S MULTIPLE PERSONALITIES

The Internet service provider has struggled to decide what kind of company it wants to be.



1989
Started offering commercial Internet access services.

SEPTEMBER
Announced a deal with Chatterjee to develop a Pan-European network.

FEBRUARY
Bought The Pipeline Network, a New York-based ISP.

SEPTEMBER
Sold nearly 90,000 accounts, mostly consumers, to MindSpring, then repositioned itself as a business-class ISP.

JUNE
Bought Internet software company InterCon Systems.

MARCH
Withdrew its proposal to purchase 33% of Haifa, an Israel-based ISP.

JANUARY
Sold InterCon to remote access firm Ascend.

APRIL
Revised its marketing strategy to go after high-end consumers.

JULY
Scrapped plan to develop Pan-European network with Chatterjee.

AimQuest expands 'Net access

By Denise Pappalardo

AimQuest Corp. is looking to enhance its offering beyond worldwide Internet access roaming services.

Late last month, AimQuest announced it will resell Siemens Business Communication Systems, Inc.'s Telephony Internet Server to support Internet telephony and fax services over its patchwork network.

AimQuest, of Milpitas, Calif., operates the growing Global Reach Internet Connection (GRIC) network, a consortium network of more than 150 Internet service providers and telephone companies from around the world. CompuServe, Inc. is the latest ISP to join, bringing more than five million new users to the GRIC.

Today, if your ISP is a GRIC member, you can access the 'Net from almost anywhere in the world for the price of a local call. AimQuest provides its Internet transaction settlement services to all GRIC members, so the billing process is seamless for users that get one bill from their ISP.

AimQuest is expanding the GRIC's capabilities by offering its ISP members the ability to use Siemens gateway servers to offer real-time voice and fax services over its network. AimQuest also announced it is testing Lucent Technologies, Inc.'s Internet Telephony Server-SP, which supports IP voice and fax traffic.

AimQuest's value to end users is not matched by many, said Traver Kennedy, director of telecommunications research worldwide at Aberdeen Group, Inc., a Boston-based consulting firm. Many GRIC ISP members offer global roaming as part of their services or for a nominal fee. Internet telephony and faxing features will be an added bonus for many users, he said.

AimQuest also announced support for Digital Equipment Corp.'s AltaVista Tunnel technology for additional security on the GRIC.

✆ AimQuest: (408) 955-1920

Slamming hits the big time

By David Rohde
Washington, D.C.

Don't want nasty surprises on your telecom bills? Tell your employees to be ultra-careful not to inadvertently authorize a change in your long-distance carrier.

Government agencies and analysts are warning users that the problem of slamming is graduating from the consumer arena to the business market. Slamming is the practice of switching users from one presubscribed long-distance carrier to another, either without the user's authorization or by tricking the user into authorizing a change.

Despite a 1995 regulation from the Federal Communications Commission that attempted to put a lid on slamming, the problem has continued to grow (see graphic). At one time almost all complaints came from residential customers, but not anymore.

"Several clients have had fly-by-night carriers cut over individual sites to exorbitantly priced services, despite the FCC's crackdown on this practice," said META Group, Inc., in a recent alert to clients.

META Group, a Stamford, Conn.-based technology assessment and consulting firm, urged clients to develop a "slamming awareness campaign." One element of such a campaign includes informing employees of the company's "strategic telecom vendors." Another is instructing local exchange carriers not to switch long-distance carriers unless instructed to do so by previously designated employees.

Even with these steps, a new practice related to slamming may leave business users especially vulnerable. Last month, the California Public Utilities Commission warned that several companies in the state are including authorization forms for telecom services in the fine print on the back of sweepstakes forms. By entering the sweepstakes, the employee automatically signs up for a service such as a new calling card. Typically, the fine print reads that the user will be billed at the rate of 20 cents a day even if the card is never used. County and state fairs are especially fertile ground for such tactics, regulators said.

Growing menace

The number of slamming complaints filed with the FCC is steadily rising.

● 1995	11,300
● 1996	16,000
● First half 1997	12,000

SOURCE: FCC, WASHINGTON, D.C.

The 1995 FCC regulation attempted to stamp out such sweepstakes tricks in which the fine print authorized a change of presubscribed carrier. But it left a loophole for additional services such as calling cards that do not involve a change in carrier, experts said.

Another emerging problem is the growing competition for toll calls within a regional Bell operating company's legal calling territories, known as local access and transport areas.

In many states, users no longer have to specially program their PBXs or instruct users to dial a five-digit access code to avoid RBOCs' typically high rates for these so-called intra-LATA toll calls. Instead, they can designate a presubscribed long-distance carrier, just as they do for ordinary long-distance calls.

"Now we're seeing complaints about slamming of intra-LATA toll service in areas where carriers are competing for presubscription," said FCC Commissioner Susan Ness in a recent Senate Commerce Committee hearing on slamming. "Once local service competition is introduced, I'm sure reports of slamming won't be far behind." ■

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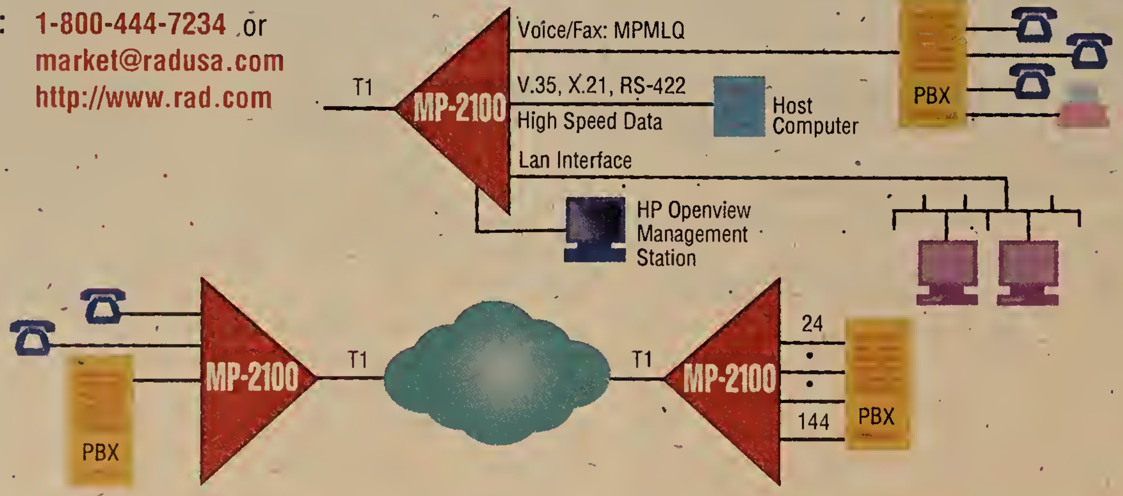

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EYE ON THE CARRIERS

The search for the next AT&T chief executive

The early betting is that the AT&T board of directors will choose as Bob Allen's heir apparent either John Zeglis, the company's top lawyer, or yet another executive from outside the telecommunications industry.

Both are bad ideas. Putting Zeglis in the top spot will only reinforce AT&T's belief that some magic tweak in the regulatory system will open the way to end-to-end telecom nirvana, instead of focusing on the technological and marketing breakthroughs that recast business history. Hiring someone from outside the industry presents another steep learning curve, and there's not much time left to convince technical and financial analysts that AT&T has its act together.

AT&T needs a proven senior executive who knows the telecom industry — and ideally, the internetwork industry — from A to Z, but who also brings a fresh perspective to the table. Such people are out there if AT&T looks closely enough. Whether or not they would take such an assignment is another story, but here are a couple of good prospects:

David Rohde

- H. Brian Thompson, chairman and CEO, LCI International. Maybe you've seen Thompson in those LCI commercials in which he needles the Big Three long-distance carriers for rounding up residential calls to the next minute or charging monthly fees for international calling plans.

In fact, the sixth-largest interexchange carrier is waging an all-fronts war on the big carriers — residential and commercial, long-distance and local, voice and data. LCI's routerless, all-Newbridge frame relay network is finally showing up on the market-share charts. And via mergers, new switch installations and a $100 million commitment to wholesale carrier IXC Communications for a high-capacity Chicago-to-Los Angeles route, Thompson is simultaneously moving LCI from its resale roots into a full facilities-based carrier and helping resolve the nationwide capacity shortage.

Thompson also would bring AT&T the corporate-turnaround experience it's looking for. A former MCI executive, Thompson took over the sickly Midwestern carrier LiTel Communications in the early 1990s. The company survived the shakeout among regional carriers and emerged as the profitable billion-dollar LCI by 1996. Significantly, Thompson accomplished this mission primarily via growth, not layoffs. As for political savvy, Thompson moved LCI to the Washington, D.C. area and hired former U.S. Assistant Attorney General Anne Bingaman to battle the regional Bell operating companies and huddle with the FCC.

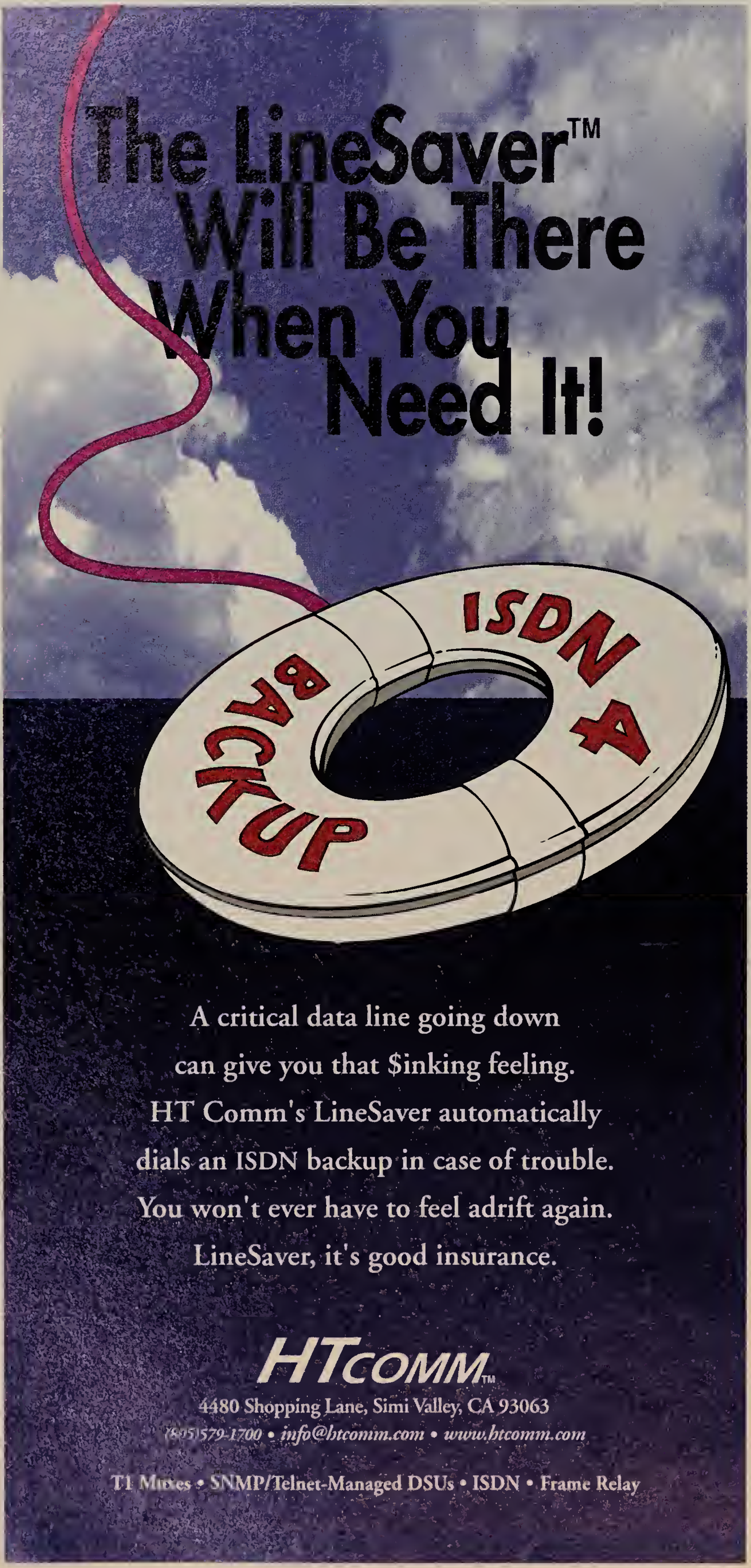
It's true that Thompson criticizes AT&T's pricing policies on TV, so joining the giant carrier might look like he's turning tail. But Thompson's barbs are equally aimed at MCI and Sprint. And unlike a lot of comparative advertising, LCI's commercials are low-key, humorous and absolutely accurate.

- David Dorman, executive vice president, SBC Communications. If an RBOC executive is bound to lead AT&T — as almost happened when Allen flirted with a merger with SBC — it might as well be someone like Dorman rather than SBC CEO Ed Whitacre. No Bell System fuddy-duddy, Dorman was president of Sprint's Business Services Group when it broke out of the starting gate ahead of AT&T and MCI on frame relay and ATM. Then he served nearly three years as president of Pacific Bell before its acquisition by SBC. That gives him a wide-ranging network services background and a unique perspective on the telecom legal wars.

PacBell earned the enmity of many when it loudly proclaimed last winter that it needed a per-minute access fee on 'Net traffic to upgrade its networks. But at least it was the first one to clarify that it was basically looking for 1 cent a minute, which turned out to be much the same position AT&T took.

In any case, Dorman knows the importance of enterprise networks in the future of any carrier that wants to be left standing five or 10 years from now.

Rohde is senior editor of Carriers & ISPs. He can be reached at david_rohde@ nww.com.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PSI

Continued from page 29

end of next year, Russ said.

Why do they have faith? Analysts seem to like the new management team. In fact, Schrader is the only one left on top since the company went public in 1994.

Pete Wills and Ed Postal, the chief financial officers and chief operations officer, respectively, have good vision and have been able to execute some of their more conservative ideas, Russ said.

And the company recently inked a deal with IXC Communications that is hard to view as anything but positive. In an agreement valued at $240 million, PSINet will get exclusive use of 10,000 miles of IXC's OC-48 fiber-optic network. In exchange, IXC gets a 20% stake in PSINet.

The deal not only gives PSINet more bandwidth, but it will let the ISP reduce fees spent on leased lines, Franco said.

Investors are ready to forgive PSINet for its past sins, but they need some proof, Franco said. Schrader said he believes his company will be able to live up to expectations, this time. ■

www.nwfusion.com

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- A look at growing pains experienced by ISPs and their customers

Network World Fusion 3616

Intranet Applications

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Multimedia • Electronic Commerce • Security

Briefs

Oblix, Inc. *last week began shipping IntraPower Suite 2.0 for Windows NT and Solaris. The suite of* **ready-made intranet applications** *includes an employee directory, room scheduler and group manager for access-controlled group discussions.*

Priced at $20 per user, IntraPower 2.0 supports the Lightweight Directory Access Protocol.

✆ Oblix: (408) 524-9700

East Hartford, Conn., start-up **Bentana Technologies, Inc.** *last week announced The Benefits Network, a Java-based* **human resources management system** *for small businesses. The software relies on the Lightweight Directory Access Protocol to let companies share employee information with business partners.*

Pricing information was not available.

✆ Bentana: (860) 289-6037

Sterling Commerce, Inc. *last week introduced the* **CONNECT:Conceal Encryption Server,** *a server that lets administrators add encryption and authentication features to an application without having to modify it.*

The encryption server, available on Solaris, AIX and HP-UX, costs $3,500.

✆ Sterling Commerce: (972) 868-5142

Sqribe Technologies, Inc. *last week introduced ReportMart, a* **Java application** *that gives corporate users access to documents they have stored in Word, Excel and other applications.*

✆ Sqribe: (415) 826-5000

Sybase delivers on Java promises

PowerJ application development tool and Jaguar transaction server beta debut.

By John Cox
Emeryville, Calif.

Sybase, Inc. last week released a high-end development tool and the final beta version of a transaction server, both aimed at customers who want to build distributed Java applications.

Beta testers said they were pleased with the PowerJ tool set and the Component Transaction Server (code-named Jaguar), especially because both worked well with applications based on Sybase's existing PowerBuilder tool and SQL Server database.

JAGUAR POUNCES ON JAVA

Sybase has rolled out the latest pieces of its Java plan for transaction-oriented Web applications.

- Final beta release of Jaguar: A transaction server that hosts Java and ActiveX software components and manages transaction requirements between Java clients and back-end databases.
- General release of PowerJ: A graphical application development tool set for building distributed Java applications. Designed to work with Jaguar.

By focusing on Java and Internet technologies in these new products, Sybase hopes to ride a surging wave of interest in building Internet-based applications that work with Web browsers as clients but still need access to existing corporate databases.

Together with Sybase's jConnect software for accessing Sybase databases via the Java Database Connectivity interface, the new products are intended to give customers most of what they need to start building and running large-scale Java applications.

Jaguar is server software that sits between client desktop computers and back-end databases. On this middle tier, customers can run application logic in the form of ActiveX or JavaBeans components, or C++ objects.

"Jaguar lets us build and store the application once on the middle tier and let different front-end applications access it," said Ken Hansen, manager of application development at Network Management Services (NMS), a Minneapolis service company that manages the flow of health and benefits data between Fortune 500 companies and their outside health plan providers.

The benefits of the multitiered approach are immediate and dramatic, according to Jeff Modell, a principal with American Management Systems, Inc. (AMS), a Fairfax, Va., systems developer. Using a thin, browser-based client and moving the application logic from the PC to the transaction server lets AMS

See Jaguar, *page 36*

Domino's says Allegro service delivers the Internet e-mail

Pizza king saving money on maintaining e-mail gateways.

By Paul McNamara
Ann Arbor, Mich.

Domino's Pizza, Inc. may be expert at getting a pepperoni and mushroom pizza to its destination. But when the goods are Internet e-mail messages, the company made famous by fast delivery turns to an outside source for service.

Domino's uses AllegroNET from Allegro Group, Inc., of Dayton, Ohio, to give its 1,400 Novell, Inc. GroupWise messaging system users access to Internet e-mail.

Allegro is one of a half-dozen companies that provide such services to LAN-based e-mail users at companies that either lack Internet connections or want to save on the costs of maintaining in-house Internet gateways.

Domino's turned to Allegro about two years ago, shortly after the service was founded by 24-year-old Aaron Fessler.

Today, Allegro counts the U.S. Navy, Mercedes-Benz USA and Continental Airlines Corp. among its major accounts.

"We didn't have any Internet connectivity, but we knew we wanted to send Internet e-mail," said Steve Zehnder, technical support team manager for the Ann Arbor, Mich.-based pizza chain. "[AllegroNET] is one of the most fantastic services that we have ever embarked on."

Allegro claims to be connecting nearly 400,000 e-mail users to the Internet, with estimates for the market segment as a whole approaching 2 million.

"Their claims of easy installation were absolutely true," Zehnder said.

"In order to set it up, you have to know a little bit about GroupWise . . . . [But you can start sending] Internet e-mail within about 30 minutes, and you can receive Internet e-mail within a couple of days."

Here is how e-mail is sent: At predetermined time intervals or accumulated volume levels, outbound messages pass through the company's GroupWise Message Server into its GroupWise Async Gateway. The gateway directs the messages over a telephone line to the Allegro GroupWise hub in Ohio. From there, the messages hit the 'Net.

INTERNET MAIL SERVICE PROVIDERS

These companies provide Internet mail connectivity services for users of Microsoft's Mail and Exchange, Lotus' Notes and cc:Mail, and Novell's GroupWise.

Company	Headquarters	Service
DWS Computer Consultants	Boston	MailWise (GroupWise only)
Fabrik Communications	San Francisco	Fabrik Connect
Lansoft USA	Columbus, Ohio	Jazz
Allegro Group	Dayton, Ohio	AllegroNET
Electric Mail Co.	Vancouver	LAN-to-Internet E-mail
Teltrust.com	Salt Lake City	dotNet

Inbound messages travel the reverse route and land in Groupwise users' in-boxes.

AllegroNET also supports Microsoft Corp.'s Exchange and Microsoft Mail as well as Lotus Development Corp.'s cc:Mail.

Allegro offers Novell customers an Encryption Gateway for GroupWise Service based on technology from Pretty Good Privacy, Inc., as well as Web hosting and consulting services.

Zehnder said Domino's franchisees and business partners are comfortable with the oft-doubted security levels afforded by Internet e-mail, primarily because they are transmitting routine correspondence as opposed to top-secret pizza recipes.

AllegroNET prices range from a flat rate of $125 per month for up to 25 users to $500 per month for more than 1,000 users. The pricing includes eight hours of toll-free connect time per month, after which connect time is billed at $8 per hour.

With a load of 3,000 outgoing and 6,000 incoming messages per month, Domino's routinely exceeds the eight-hour limit, Zehnder said. But he said the extra charges are reasonable and, overall, the deal is a bargain.

Domino's eventually may bring its Internet e-mail in-house, but not any time soon and not before a number of questions get answered, Zehnder said.

"Do we have the expertise to do it? What's it going to take?" he said. "Until we decide that this project is very important, or one of the financial department representatives says the bill is getting high, [doing it ourselves] is not high on the list of tasks."

✆ Allegro: (937) 264-7000

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Jaguar

Continued from page 33

extend applications to vast new audiences.

For example, taking an existing procurement application originally built with PowerBuilder, AMS used PowerJ to build a new desktop front end to the application and used Jaguar on Windows NT to run the application logic. As a result, one AMS customer is now considering deploying the new software, via Web browsers, to some 7,000 employees instead of just the 125 purchasing specialists who used the previous version.

"We took our PowerBuilder code, made it into ActiveX Controls and ran these on Jaguar," Modell said. "The front end is just eight lines of Java code. We've found that integrating Jaguar with our [existing] application is pretty simple."

Neither beta site has had a chance to really test Jaguar's transaction management features, which will be critical in future large-scale applications. "We'll use these features to manage and balance the processor load as we add users," said Michael Whittington, manager of MIS product development at NMS. For example, Jaguar will let NMS allocate server resources to a given set of Jaguar objects. This will ensure fast response time for end users accessing the application through an interactive voice response front end.

To further enhance Jaguar's appeal, Sybase will support the emerging Enterprise JavaBeans specification being created by Sun Microsystems, Inc. This specification is a set of new JavaBeans APIs that will let Java components on a server behave properly in complex transactions.

Sybase is focusing PowerJ as the tool of choice for developers who want to build this type of component software. "If PowerJ can in fact build server-side Java applications, it will be a big help, because most of the new Java development tools are very client-oriented," said Mitch Kramer, senior consultant with the Patricia Seybold Group, Inc., a Boston-based technology research company.

But Kramer also pointed out that Jaguar is a brand new product from Sybase and the initial release will lack the full range of features found in more mature, traditional transaction processing monitors.

Jaguar will be generally available by the end of September; pricing has not been announced. PowerJ, available now, is priced at $1,999 per developer.

☎ Sybase: (510) 922-3500

Get more online:

- An overview of a proposed Java database query optimizer
- Overviews of the Java Database Connectivity spec
- A Sybase white paper about its Java strategy

NetworkWorld Fusion

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Firms create e-commerce app

By Kristi Essick

Santa Clara, Calif.

Java software developer Encanto Networks, Inc. has joined with electronic commerce software company CommerceWave, Inc. to develop a Java-based application aimed at helping small businesses set up shop on the Internet.

The companies will design, build and market a merchandising and payment application suite designed for small businesses. The software will allow companies to create an online shopfront and catalog, and also will take care of the back-end payment processing using VeriFone, Inc.'s Virtual Point of Sale (vPOS) technology.

The electronic commerce package, which will be released by Encanto by year-end, will include CommerceWave's merchant catalog and Internet storefront tool, which relies on vPOS technology for payment processing. VPOS is a transaction protocol that uses the Secure Electronic Transaction standard developed by MasterCard International, Inc. and Visa International, Inc.

Small businesses will be able to design, update and administer their Web sites using Encanto's do-it-yourself Web site building software, which is written in Java. The software will offer small businesses without much capital or technical experience the chance to build an electronic commerce site. For more information, contact Encanto at (408) 492-1212.

Essick is a correspondent with IDG News Service's London bureau.

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NET INSIDER

Virtual reality and the cost of the Internet

The August 1997 issue of the *Communications of the ACM* has an article on Internet pricing that I don't understand at all. It could be that there has been a time warp and an article submitted for publication five or 10 years ago just popped up. Or maybe the article is in the spirit of most of the rest of the issue, which is about virtual reality.

Scott Bradner

The article, entitled "Internet Pricing vs. Reality," starts out on a tangent to the reality that the title espouses. The second sentence is "Should [the Internet] be 'free,' as many computer enthusiasts seem to expect?" I know a lot of "computer enthusiasts," but I don't think I know anyone who thinks that the Internet should be "free," any more than people think phone service should be free.

The author takes quite a bit of time in the article to try and figure out just what it should cost to send one bit of data over the Internet. He uses many pieces of information to make a number of cost estimates. He comes up with a range of cost estimates extending from a low of 0.07 microcents to a high of 1.6 microcents per bit. Even if one could agree that the actual basis for each estimate was reasonable (I don't), the range of estimates would seem to make the results somewhat hard to use.

The author does not seem to know all that much about the Internet itself, claiming at one point that "the Internet is composed of DS-3 transmission lines" as if the Internet were some one "thing." In actuality, the Internet is composed of thousands of individual data networks, with backbone links ranging in speed from 9.6K bit/sec in some parts of the world to 622M bit/sec in other places. Each of these networks also has its own cost structures, making any estimate of the actual cost of transporting data on the network quite chancy indeed.

But my biggest problem with the article is not what I see as a poor understanding of the Internet and its technology, but with the conclusion the author comes to.

In the last part of the article the author says that the government should not be "subsidizing and supporting a public data network." It is very hard to see where this comes from. Years ago, the U.S. government provided direct subsidies in support of the regional and some national data networks, but these are long gone.

I know a lot of "computer enthusiasts," but I don't think I know anyone who thinks that the Internet should be "free," anymore than people think phone service should be free.

Today the National Science Foundation (NSF) gives some initial funding to help some research universities connect to a very-high-performance backbone to do precompetitive research in the applications that will be running on the Internet of tomorrow (note though that the universities must still buy their normal Internet connections with their own money). NSF and other government agencies also support research into advanced networking technologies. I do not see these activities as subsidies for the Internet any more than support for research in genetics is a subsidy for drug companies. At best, the article is a time warp, but it is more likely about some other reality.

Disclaimer: Even if Harvard is its own reality, as some claim, these words reflect my own opinion on the common reality.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached via e-mail at sob@harvard.edu.

Does Your Business Receive Calls From Payphones?

Are You Concerned About Telecommunications Costs?

Write to the FCC Now!

The FCC was required by Section 276 of the Telecommunications Act of 1996 to establish "fair" compensation to payphone providers for all calls completed from their payphones. The D.C. Circuit Court of Appeals ordered the FCC to reconsider the methodology they used to establish the rate for toll-free and calling card calls, because of the substantial cost differences in handling local coin calls versus toll-free and calling card calls. Under the FCC's original order, payphone owners would have collected more than one billion dollars annually for completing toll-free calls, but we now have an opportunity to recommend compensation rates at more reasonable levels.

The following issues are critical for the FCC to consider in setting "fair" compensation:

- A fair compensation rate must be based on payphone providers' actual cost of handling toll-free and calling card calls (AT&T estimates this at about $0.133 per call).
- The $.35-per-call rate proposed by the FCC is outrageous! That rate would double the cost of payphone originated calls for many toll-free and calling card customers.

Comments must be received no later than September 9, 1997.

Office of the Secretary, FCC, Room 222
1919 M Street, N.W., Washington D.C. 20554.
Reference in your letter: CC Docket 96-128 Payphone Compensation.

AT&T

PeopleSoft overhauling applications suite, adding Java-based interface

New version to slash network traffic via three-tier architecture.

By Ellen Messmer
Pleasanton, Calif.

PeopleSoft, Inc. is redesigning its business applications suite to help customers dramatically reduce network traffic loads.

In PeopleSoft 7, expected to ship this month, the company is abandoning the two-tier client/server architecture in favor of a three-tier plan. The new architecture puts a transaction processing application server between the client and back-end data server.

The three-tier architecture will generate up to 70% less traffic than the two-tier scheme, said Stan Swete, PeopleSoft's vice president of product strategy.

"With a sales entry order, for example, a process update can involve 35 SQL queries," Swete said.

"The application server will have a Tuxedo transaction processing monitor that can take all those SQL statements and send them back in a single message. There are going to be a lot fewer messages, and we'll have a more network-efficient link back to the database," he said.

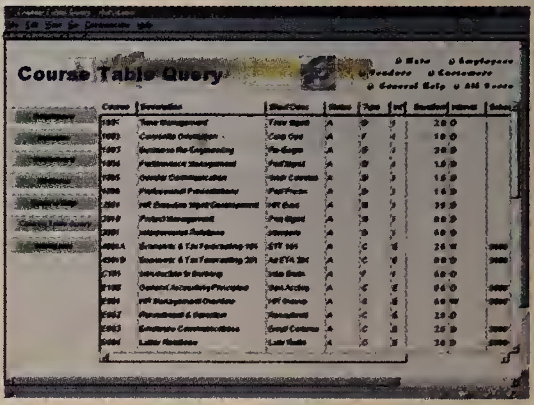
PeopleSoft also is providing customers with Java-enabled Web browser access to its applications.

The company has long supplied a proprietary Windows-based client for end users of its human resources, accounting, order entry and manufacturing logistics packages.

But with PeopleSoft 7, customers will be able to decide if they want to use a Java-based Web browser to access a new set of horizontal applications, such as job postings, training registrations and electronic pay stubs.

PeopleSoft will deliver the Java applet for these universal applications by integrating BEA Systems, Inc.'s Java Online Transactions engine in the application server, Swete said.

Customers said they are looking forward to PeopleSoft 7.



With PeopleSoft 7, *customers will be able to decide if they want to use a Java-based Web browser to access a new set of horizontal applications, such as a listing of courses shown here.*

"The two-tier architecture has some limitations because you swap files across the network and it generates a lot of traffic," said Norman Muttitt, senior applications manager at Mobil Corp., which plans to jump to Version 7.0 from Version 5.0.

"Some of our PeopleSoft users are in remote places and only use dial-up, so it can really be time-consuming. But the three-tier architecture should enable a great amount of relief there," Muttitt said.

© PeopleSoft: (510) 225-3000

Technology Update

Covering: Evolving Technologies and Standards

NUTTER'S NETWORK HELP DESK

Ron Nutter, a Master Certified Novell Engineer and Groupware CNE in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 476, or send your questions to rnutter@world.std.com.

I recently installed several Windows NT 4.0 workstations on my network using Novell, Inc.'s Client32 for Windows NT.

After several weeks, one of the workstations started displaying an error message indicating that it couldn't find NWAPI32.DLL in any of the paths listed in the dialog box that mentioned the missing Dynamic Link Library.

A Novell support technician said this is a known corruption issue, and the only way to resolve it is to reformat the hard drive and reinstall Windows NT.

I don't consider this an acceptable option. Do you have any suggestions?

Via the Internet

Technical reference article Q109086 in the August version of Microsoft Corp.'s TechNet CD-ROM indicates that this error message can be caused in part by the presence of the NOVELL.CPL file in the SYSTEM32 directory below the Windows NT directory. This file is used to display a configuration icon in the Control Panel applet.

So I would uninstall Client32 for Windows NT, delete the NOVELL.CPL file and restart the workstation. It should start up without the error message. Then you can reinstall the client.

In addition, install antivirus software because a virus may have caused this problem. It also would be a good idea to install a copy of Norton Utilities for NT, which allows you to recover files deleted from a DOS prompt.

You should check this machine against one of the others you installed to see if the missing file is present on another system.

If it is, copying the file into one of the directories should resolve the problem. You can find the file on the Microsoft NT Workstation CD-ROM.

It also might be worth backing up the machine to tape after it is configured the way you want.

Building future multiprotocol LAN backbones with ATM technology

Finalized MPOA specification improves performance and lowers costs.

By Jeff Aaron

Since the ATM Forum finalized details of the Multi-Protocol over ATM (MPOA) specification in July, vendors have positioned the technology as the primary tool for building future LAN backbones.

Every major LAN internetwork vendor, including Cisco Systems, Inc., Bay Networks, Inc., Newbridge Networks, Inc., Cabletron Systems, Inc., FORE Systems, Inc. and IBM, has announced support for the MPOA standard for Layer 3 switching. Many of these vendors have been shipping MPOA-based products since the beginning of the year.

While MPOA promises much, the most notable benefit associated with MPOA is improved routing throughput. MPOA turbocharges routing performance by mapping flows of net traffic, such as multiple TCP/IP packets destined for the same location, to shortcut paths.

By replacing hop-by-hop processing of individual packets, MPOA reduces the number of route table lookups that are required. In addition, the environment enables traffic forwarding to be handled in ATM switching hardware, rather than software, which also should improve performance.

Making it simple

MPOA also simplifies network configuration and helps network management. This stems from the fact that MPOA centralizes routing intelligence within a single device — the MPOA server. Consequently, this is the only piece of equipment that needs to be configured by a network administrator.

Once broadcast domains, filtering information or any other networkwide policy is established here, it is disseminated throughout the network via standard signaling and encapsulation techniques that are defined by the MPOA specification.

The architecture enables network administrators to enforce enterprisewide policies without having to configure access lists in every device in the network. As a result, MPOA minimizes the burdens associated with setting up and changing a network.

MPOA uses virtual network capabilities to let administrators logically assign access to network resources. For example, physical port location, protocol type, network address and application type, such as IP Multicast, are some of the criteria that can be used to assign virtual LAN membership.

UP CLOSE

Building better backbones

The ATM Forum recently approved the Multi-Protocol over ATM (MPOA) standard as a way to speed routing performance in ATM-based nets. MPOA replaces hop-by-hop processing done by today's routers and enables traffic forwarding to be handled in ATM switching hardware, rather than software. The result is wire-speed routing and bridging services over ATM services.

MPOA "SWITCHED-ROUTING" ENVIRONMENTS ARE MADE UP OF:

- ▶ Route servers: These integrate Layer 3 routing and Layer 2 switching. The server performs the routing and cut-through forwarding functions for hosts and edge devices in an MPOA net.
- ▶ Edge devices: These are traditional LAN servers, routers or other connectivity devices that link Ethernet, Fast Ethernet, token-ring and other LAN traffic to the ATM backbone.
- ▶ ATM hosts: Attached to the ATM backbone via ATM network interface cards, these boxes store end-user resources in ATM environments.

SOURCE: ATM FORUM, MOUNTAINVIEW, CALIF.

With these different policies, network administrators can establish separate domains for users with similar network requirements, such as those individuals that need guaranteed quality of service (QoS) to run a video-based application. In addition, users within common communities of interest, such as members of a team that require access to a shared workgroup server, can be joined into the same virtual networks.

By using standard signaling and encapsulation techniques, MPOA's virtual networks are guaranteed to work across multiple vendors' equipment. Finally, because MPOA will be interoperable with 802.1q — the IEEE standard under development for establishing VLAN connectivity in a frame environment — this solution offers the greatest connectivity options of any virtual network solution on the market today.

MPOA offers another distinct advantage over other frame-based approaches to Layer 3 switching: It uses ATM as a backbone technology. Because ATM is a connection-oriented technology, when two devices are communicating with one another, they do so via a dedicated shortcut path, such as an ATM virtual circuit. Not only is network bandwidth guaranteed across this path, but various QoSes also can be applied. This ensures successful delivery of all types of traffic, including voice and video, as well as data.

With MPOA, shortcut paths are determined on an end-to-end basis. This means that a path from source to destination is determined before the first packet of data is ever transmitted. By eliminating the need to perform path selection hop by hop, this method of delivering traffic minimizes latency and provides deterministic end-to-end delay. As a result, MPOA is ideal for supporting time-sensitive applications, such as videoconferencing and telephony.

A good fit

MPOA also is interoperable with existing LAN internetwork equipment. Because MPOA edge devices provide standard Layer 2 interfaces, for example, existing network interface cards, cables, hubs, switches and routers can be plugged directly into these devices.

In addition, because MPOA supports TCP/IP, SPX/IPX, AppleTalk, NETBIOS and other network protocols, there is no need to modify existing protocol stacks in users' machines.

Finally, MPOA servers utilize conventional routing protocols, such as Routing Information Protocol and Open Shortest Path First, to learn and communicate topology information with existing routers.

As a result, MPOA fully protects existing investments in all internetwork hardware and software.

MPOA solves many of the issues in today's LAN backbone environments by improving routing performance, increasing scalability, improving cost efficiency, simplifying configuration and enhancing network management.

Aaron is product marketing manager for the VIVID MPOA-based family of products at Newbridge Networks, Inc. He can be reached via the Internet at jeff_aaron@us.newbridge.com.

Need information?

Let *Network World* provide a quick primer on an important or emerging technology. If you have an idea for Technology Update, contact Michael Cooney by phone at (508) 875-6400 or e-mail at michael_cooney@nww.com.

EDITORIAL *insights*

Co-opetition at work

Last week, I witnessed something remarkable.

Executives from across the industry gathered in Boston and, with prodding from Kevin Tolly and *Network World*, hammered out a plan to bring token ring into the future. IBM, Xylan, Cabletron, Cisco, 3Com, Bay, Madge, Proteon, Olicom and others agreed to back a standard for native, high-speed token ring that will allow users to upgrade their backbones — perhaps even desktop links in the future — without abandoning token ring.

In the most competitive industry on the face of the earth, some 40 executives committed their companies to supporting this new IEEE 802.5 standard. They also agreed to form a High-Speed Token Ring Alliance to speed the standard's development.

What was most fascinating to watch was the group's two-hour effort to define a simple mission statement. The statement spells out the vendors' commitment to the standard and their resolve to deliver at least prototype products based on it in less than a year.

The mission statement reads: "We resolve to pursue an 802.5 standard for dedicated, High-Speed Token Ring that scales from 100M bit/sec to at least 1G bit/sec. The standard will support the key attributes of today's token ring and will be developed in time for multivendor demonstrations of High-Speed Token Ring technology at the NetWorld+Interop conference in spring 1998. The standard will support the 802.1q standard for multiple VLANs. The goal of this standards effort is to deliver the most cost-effective upgrade path for token-ring customers."

Some critics have questioned the logic of this effort, given the availability of Fast/Gigabit Ethernet and ATM upgrades for overstressed token-ring nets. But surveys conducted by the vendors show that a significant chunk of customers — typically large corporate customers — want the option of upgrading with higher speed token ring.

The suppliers don't harbor any illusions that Fast Token Ring will somehow swing the tides of battle vs. Ethernet. Ethernet has won the market share fight. But the token-ring industry needed a next-step solution for customers.

In the past few months, the token-ring industry has made remarkable progress in answering a key customer question: Is token ring still viable? If these companies follow through on their commitments to the proposed standard, the answer will be yes.

With The Tolly Group, *Network World* has pushed the vendor community to provide a future path for customers. We'll keep pushing for more progress. But if you are a token-ring user, you need to stay on top of this, as well. Make sure your supplier does more than just voice support for High-Speed Token Ring. Make sure it delivers.

John Gallant, editor in chief jgallant@nww.com

Totally Unplugged • Ira Brodsky

E-comm policy: You're free to do what the gov't wants

One of my all-time favorite TV programs is *The Prisoner,* a 1960s science fiction thriller. After resigning his post as a British secret agent, the hero, played by Patrick McGoohan, is kidnapped and imprisoned in The Village. He doesn't know where The Village is or where its rulers' allegiance lies. Although residents are given the illusion of freedom, they are really the victims of sophisticated psychological manipulation.

Some critics believe *The Prisoner* is an allegory for modern democracy. In developed countries, the greatest threat to freedom may not be nightstick-wielding police, but the subtle deceptions of media-savvy politicians.

The Clinton administration's Internet tome, "A Framework for Global Electronic Commerce," is a case in point. Brimming with phrases such as "market-driven" and "pro-competitive," the document actually lays the groundwork for the next phase of government intervention.

The first red flag is the framework's chief architect, Ira Magaziner. Magaziner is the same Clinton administration strategist who plotted a government takeover of the health care system. Has Magaziner suddenly embraced the libertarian sentiments pervasive on the 'Net?

Commentators who believe Magaziner has undergone a genuine transformation should take another look at the American Health Security Act. It claimed to promote competition, reduce administrative costs and impose budget discipline by establishing a hierarchy of committees. Yeah, right.

On the surface, Magaziner's framework advocates market forces, rather than government regulation, as the driver for electronic commerce. But if this is truly the administration's view, why did it feel the need to publish its framework in the first place?

To learn the answer, examine the framework's five principles.

Principle No. 1 states: "The private sector should lead." This sounds very promising — until we read "private-sector participation should be part of the policy-making process."

Principle No. 2 reads: "Governments should avoid undue restrictions on electronic commerce." But this implies other restrictions are necessary — without clearly defining what they are or how they will be enforced.

Principle No. 3 begins with the telltale phrase, "Where government involvement is needed . . ." Echoed here is much of the same thinking found in the American Health Security Act: Government intervention is necessary to ensure competition, protect privacy and foster transparency.

Principle No. 4 is: "Governments should recognize the unique qualities of the Internet." The document goes on to explain that 'Net regulation should not be modeled after radio and television regulation. Pardon me, Mr. Magaziner, but didn't you say electronic commerce should not be regulated?

The fifth and final principle is really a desperate call for help: "Electronic commerce over the Internet should be facilitated on a global basis." What this means is the U.S. is going to require the assistance of other governments if there is to be any hope of controlling the beast.

Here is the crux of the problem:

Most of the freedoms the framework advocates are made possible by technology. By pretending to grant us what we already possess, Magaziner is not renouncing the role of government — he's attempting to salvage it.

In *The Prisoner,* the people in charge of The Village tried to trick the hero into believing their best interests were his best interests. Through its framework for global electronic commerce, the Clinton administration is trying to do the same. Magaziner's five principles can be boiled down to one: "You can do whatever you want, as long as it is what we want."

Brodsky is president of Datacomm Research Co., a Chesterfield, Mo.-based consulting firm. He can be reached via the Internet at ibrodsky@ix.netcom.com.

MESSAGE QUEUE

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, *161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.*

NCs have a place

Thomas Nolle's opinion column "Network computers: More hype than hope" (Aug. 4, page 49) is full of misinformation and misinterpretation.

Nolle says, for example, "We want fancy graphical interfaces, fast spreadsheet recalculation, good presentation graphics, a wealth of shrink-wrapped software and more. We are not going to get these things from NCs . . ." He ignores just-in-time compilers as well as the new chips that execute Java byte codes directly. As for graphics and graphical interfaces, these are much of what NCs are all about. In fact, if it isn't graphical, it's not an NC.

Speaking the LANguage • *Linda Musthaler*

Keeping a data trail is the best defense

Network World recently featured a cover story on "digital detectives," an elite group within the FBI that searches for digital evidence of crimes (July 7, page 1). Along with many private firms, this government-sponsored task force is part of a new and growing field called computer forensics — sort of the *I Spy* of the 'Net.

According to Judd Robbins, president of Presentation Dynamics, Inc. (www.knock-knock.com), computer forensics is the application of computer investigation and analysis techniques to search for potential legal evidence. Computer experts draw on an array of methods for discovering data that resides in a computer system or for recovering deleted, encrypted or damaged files.

Why should you care about this? Because IS and network managers are responsible for handling and preserving data that might someday be deemed evidence in a lawsuit. Therefore, according to Rick Moher, forensic consultant with Ontrack Data International, Inc. (www.ontrack.com), you increasingly are becoming key individuals when corporate litigation is involved.

MARTY BRAUN

If a lawsuit is filed by or against your company, you might be called upon to produce current or archived copies of your disks. Even "deleted" or overwritten files are fair game for lawyers.

That's where computer forensics experts come in. They know how to find hidden data.

Michael Anderson, president of New Technologies, Inc. (www.secure-data.com), explains that data evidence resides at three levels. The first is the file level, known to users and administrators alike. Even unsophisticated computer users can easily access and erase data at the file level.

The second level is the erased file or unallocated space. This space is a volatile area of the disk because the computer reuses it arbitrarily. It takes some sophisticated tools to read data hidden in this space.

The third level, where experts often find their data gems, is called the file slack, or the space between the actual end of the file and the end of the space allocated for the file. This area is extremely volatile and requires some expertise to access.

In computers running Windows, there is a fourth area where evidential data might be found: the Windows swap file, where data is placed temporarily to improve the performance of the operating system.

Who makes use of computer forensics evidence? According to Robbins, it is used in many types of criminal and civil proceedings.

For example, criminal prosecutors might be interested in incriminating documents indicating financial fraud or embezzlement. Insurance companies use computer evidence in cases of possible fraud in accident, arson and workmen's compensation cases. Corporations might want to gain evidence relating to sexual harassment, embezzlement, theft of trade secrets or the misappropriation of confidential information. Even individuals may seek evidence supporting claims of sexual harassment, age or racial discrimination, or wrongful termination.

As network manager, the guardianship of evidential data is in your hands. There are steps you can take to ease the pain of a compromising situation for your company. Fortunately, you probably already follow a few of the rules.

First, maintain several generations of complete data backups in a restricted-access, fireproof vault. Because file-level erasure is the initial target for miscreants who want to delete incriminating data, you must eliminate all unauthorized access to backups.

Second, institute a formal company policy that informs all users that the content of the computer system belongs to the company. In the absence of such a policy, data is considered private, leaving the company open to civil liability.

Further, instruct users that any and all messages and files they use — or abuse — are potential sources for litigation from inside or outside the company.

If you suspect a situation in which the computer system might harbor evidence of a crime or other inappropriate act, or if a lawsuit is filed by or against your firm, take immediate action to preserve that evidence. Anderson recommends you isolate the computer and discontinue use, if possible. While you can't do this with a server, you can isolate a desktop or notebook PC rather easily.

Next, perform a full mirror-image backup of the affected disks. This will preserve data in the volatile areas that don't get copied in a simple file backup.

Computer forensics experts can help you ferret out the data nuggets that will prove your point in a lawsuit or criminal case. In addition to the three companies I've mentioned, there are many others from which to choose.

With computers increasingly becoming the targets or the enablers for crime, it pays to be aware and prepared.

Musthaler is vice president of Currid & Co., a Houston-based technology consulting firm. She can be reached via the Internet at linda@currid.com.

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pudding is in the failure of diskless workstations to catch on." These came out before the advent of networking and programming tools — and the experience — we have now. The business, economic and social climates also count for something. People felt they were becoming empowered and were dreaming of how they could use their power; then that power turned around and bit a lot of people, in terms of cost, maintenance and the so-called futz factor.

Nolle tries to equate Java byte codes with the old Pascal p-codes. They are not the same, and there were few companies behind p-code. It is also true that p-code never addressed issues of networking, graphics, security and many others at all, let alone to the astounding degree that these are addressed in Java. And the reason p-code was slow? Those were the days of 1-MHz to 8-MHz machines; of course they were slow.

Nolle is right that NCs will not replace PCs in general. The point is NCs will replace PCs where appropriate — in environments in which a general purpose computer is overkill, where a simplified desktop (or no desktop) is needed, where users cannot be expected to be their own administrators, where security is necessary, and so on.

Oh, well. I remember arguing with a friend that the 3.5-in. hard-shell floppy disks were superior to the 5.25-in. genuinely floppy ones he used. He didn't agree. The market agreed, and now my friend is a believer. Let's let the market decide this one, too.

David Moffat
Cary, N.C.

Yes — I've heard over and over that NCs are just the dumb terminals of the '90s. Many of the folks spouting this rhetoric are still stuck in the mind-set that the PC of 1977 will be the architecture and model for all future information technology.

As an Internet user and developer for 10 years who was raised on PDP-11s, I think PCs are long overdue for a change.

In fact, I hate PCs — always have. The beauty of the Internet is that there's very little about it that requires computer-centric thinking, other than that historically we have no other consumer or common business devices that have been able to support it. But that will change.

The PC paradigm isn't dead, but it's tired, old and in need of rethinking.

NetPCs and NCs may not be the answer, but they indicate that the days of PCs as we have known them for the past 20 years, like the mainframes of the past, are numbered.

Greg Sherwin
Senior software engineer, Emerging Services
CNET: The Computer Network
San Francisco

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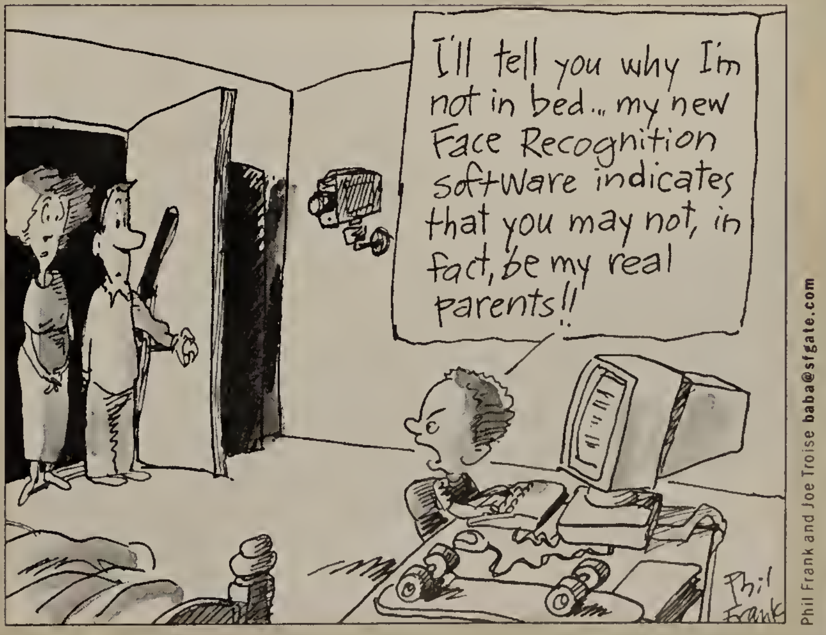
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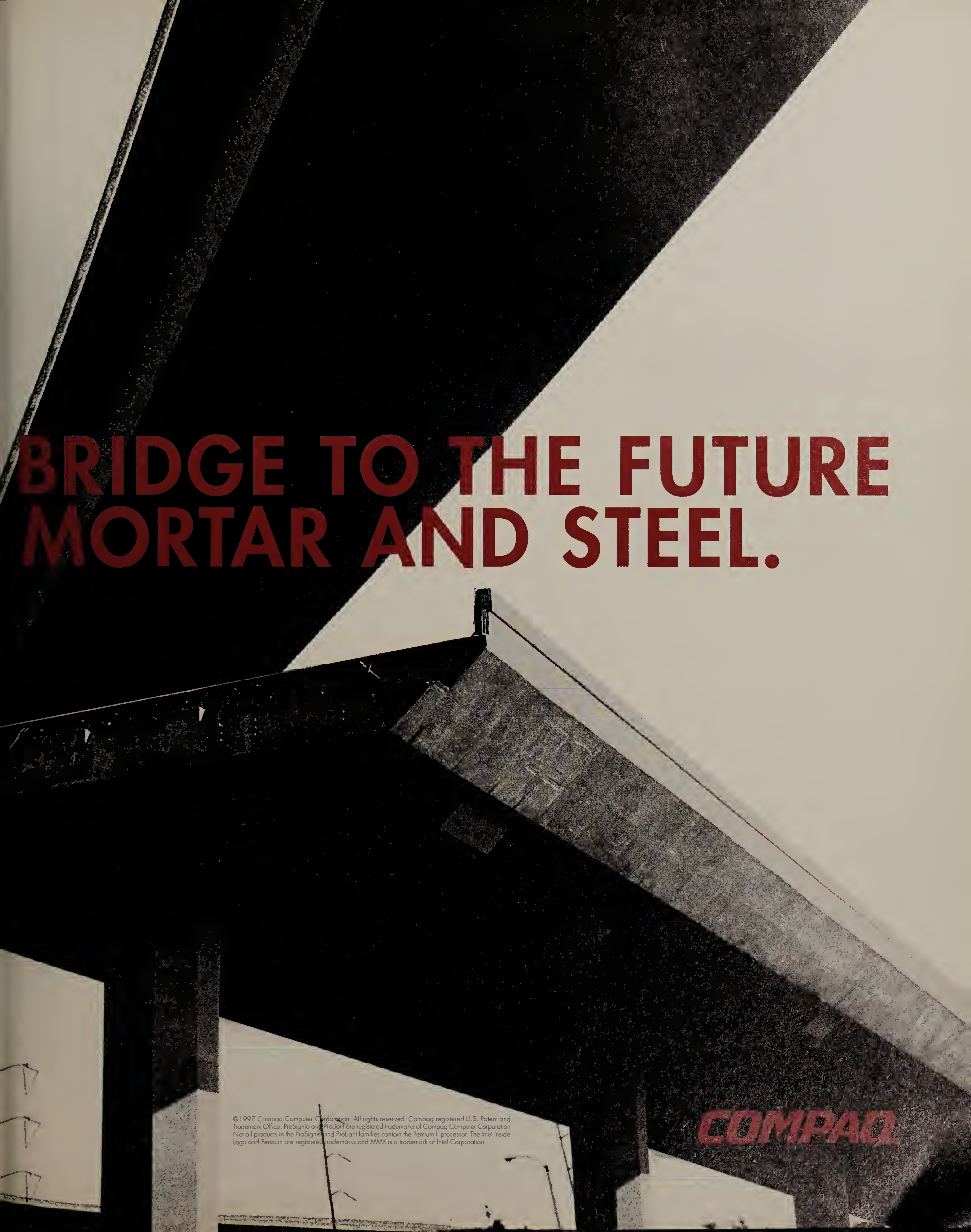

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1997 SALARY SURVEY

Continued from page 1

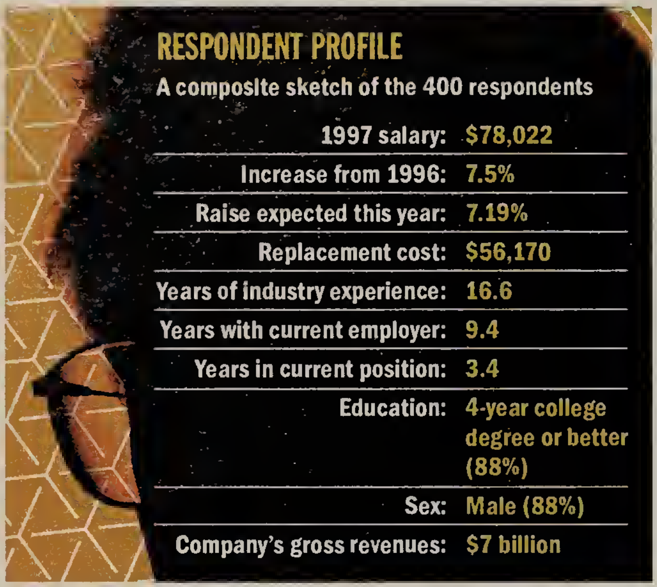
Weaver's raise is slightly higher than the average, judging from the returns of the 1997 *Network World*/Deloitte & Touche Consulting Group Salary Survey. The 400 network professionals surveyed saw their salaries jump an average of 7.4% this year, up a notch from the average raise of 7% reported in last year's survey. Weaver can expect his paycheck to grow more next year, too. Respondents said they expect raises of between 4.9% and 6% during the next 12 months.

Clearly, network professionals are doing better than the average worker, whose paycheck expanded by a more modest 3.2% in the year ended June 30, according to the U.S. Bureau of Labor Statistics.

THE COMPLETE 1997 SALARY PICTURE

	Average 1997 salary	Average percentage increase expected from '97 to '98	New-hire replacement cost (salary paid to add or replace a person in this position)	Average number of years in job
Management/Strategic planning				
Sample titles: CIO, VP, director, network manager, data communications manager, telecommunications manager, technical support manager				
Senior	**$100,340**	**6.0%**	**$91,516**	**10.5**
Entry	**$61,493**	**5.8%**	**$56,431**	**4.6**
Project management				
Sample titles: Consultant, VP, director, network manager				
Senior	**$81,142**	**5.7%**	**$70,575**	**8.6**
Entry	**$52,642**	**5.6%**	**$48,175**	**3.5**
Engineering				
Sample titles: Network architect, engineering manager, consultant, designer, analyst, engineer				
Senior	**$78,596**	**5.5%**	**$69,497**	**8.8**
Entry	**$48,859**	**5.8%**	**$44,106**	**3.3**
Operations/Provisioning				
Sample titles: Data center manager, training manager, technical support manager, net management or technical support specialist, network operator, help desk operator				
Senior	**$66,313**	**5.1%**	**$57,392**	**8.2**
Entry	**$39,495**	**5.1%**	**$36,697**	**3.2**
Vendor or User liaison				
Sample titles: Contract manager, client support manager, user support manager, client liaison				
Senior	**$68,643**	**5.3%**	**$54,545**	**6.9**
Entry	**$42,030**	**5.2%**	**$34,960**	**2.6**
Communications finance				
Sample titles: CFO, communications finance officer, financial analyst				
Senior	**$82,723**	**5.3%**	**$75,000**	**8.3**
Entry	**$43,034**	**4.9%**	**$41,222**	**3.3**
Application development				
Sample titles: Client/server programmer, development manager, programming manager, programmer, systems analyst, database administrator				
Senior	**$76,449**	**5.4%**	**$68,471**	**7.8**
Entry	**$44,006**	**5.3%**	**$39,305**	**2.7**

Note: Respondents were asked to include salary information for all positions that report to them or for which they had reliable information.



RESPONDENT PROFILE

A composite sketch of the 400 respondents

1997 salary:	$78,022
Increase from 1996:	7.5%
Raise expected this year:	7.19%
Replacement cost:	$56,170
Years of industry experience:	16.6
Years with current employer:	9.4
Years in current position:	3.4
Education:	4-year college degree or better (88%)
Sex:	Male (88%)
Company's gross revenues:	$7 billion

The respondents we surveyed work for large companies that report revenues of more than $1 billion annually. Why? Because, as Weaver's experience illustrates, no matter the size of your company, you've got to compete against the big guys for the top talent.

"Most companies are working very hard to make their company a good place to work," says Frank Schoff, president of Management Recruiters, of Cedar Mountain, N.C. "So the competition is stiff all the way around — that includes benefits and perks and everything else."

But the survey refutes the notion that technology workers are jumping ship every few months in search of fatter paychecks and leading-edge jobs. Respondents reported being in their current position for an average of three years and with the same employer for an average of a decade. Still, many of those employees are hearing about plenty of opportunities, so it's critical to make sure they're happy.

"I don't think a day goes by that one of my consultants doesn't get a job offer from a client," says David Jackson, vice president of the network systems consulting practice for The Registry, a Newton, Mass.-based integration firm.

Jackson and others report getting off-the-chart salary demands from some prospective employees. While he counsels that companies have to keep up with the competition, they don't have to be held hostage.

"We get people who've recently received first-level certifications and who have limited consulting experience expecting $90,000 to $100,000 right out of the box," he says. "But we pass on those people. We're very firm about the ranges we pay and the levels of experience [we require]."

The chart on page 45 shows the salary breakdown by position. As expected, those with strategic planning and project management skills come out on top, whereas those with operations and liaison skills fall lower on the pay scale. While skilled employees are in demand, employers reported that those with top-shelf technology skills and management experience are even harder to find.

An MIS manager for a leading national transportation firm, who asked not to be named, said it has become almost impossible to find employees with good project management skills.

"It's a killer," he says. "We've contracted outside for some certified project managers either because we couldn't find them or we couldn't find them quickly enough."

Broader management skills and the ability to deal with other branches of the business are becoming increasingly important, especially with the implementation of large-scale financial and business systems such as SAP, according to Glenn James, partner in the telecommunications and media practice of Deloitte & Touche.

"The challenge is not talking just routers, ATM, IP and all that stuff," James says. "You've got to be able to talk the application and the business process as well."

Finding people with those skills, many of which don't show up on a resume, takes innovation. "You have to look in places where you haven't traditionally looked, maybe people coming out of MBA schools who used to work at HP or IBM or Digital,

STAY IN SCHOOL

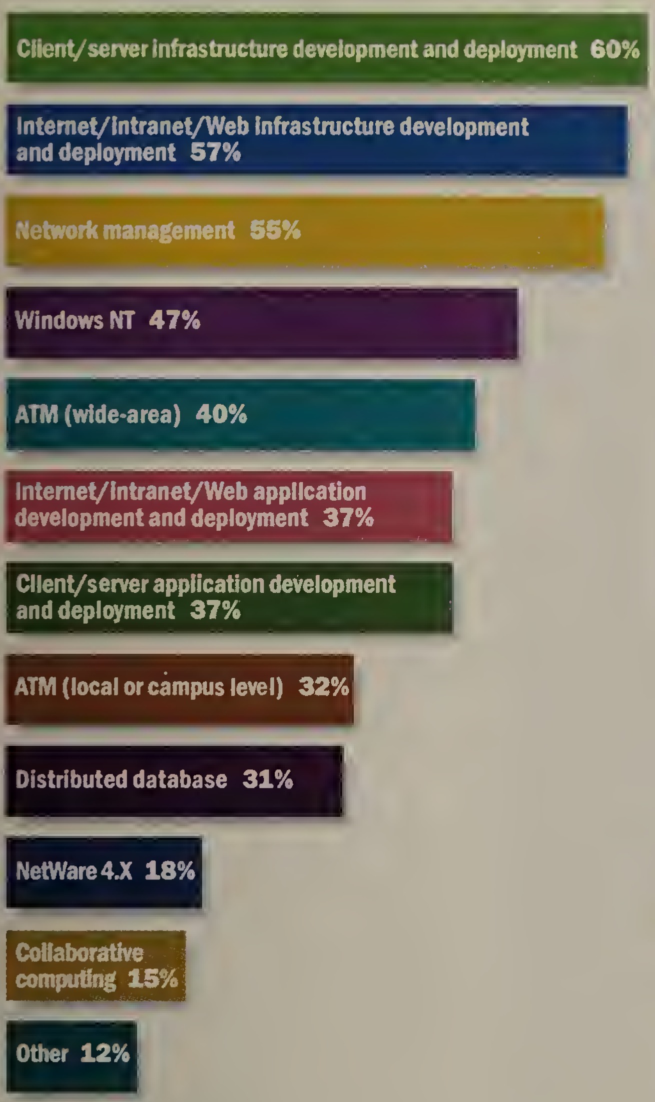
Figures on respondents' average salary as it relates to level of schooling show you can still make a decent buck without a college degree, but the well-educated fare better every time.

	Degree earned					
Year	High school	Associate's	Bachelor's	Master's	Doctorate	Other
1996	$58,887	$62,729	$68,937	$76,263	$83,167	$80,500
1997	$64,840	$67,443	$74,543	$81,503	$88,375	$82,600
1998 (Est.)	$64,936	$73,143	$79,822	$87,789	$94,718	$85,250

SKILLS IN HIGH DEMAND BUT SHORT SUPPLY

Percentage of respondents who chose each category. More than one response was allowed.

Based on 308 responses



as opposed to just getting someone from Bell Labs," he says.

Skill-wise, the survey reveals that the biggest gulf between supply and demand exists in client/server and Internet/intranet network infrastructure development and deployment, as well as network management. More than half of all respondents said they would be willing to pay premiums of 16% to 17% to employees with those skills.

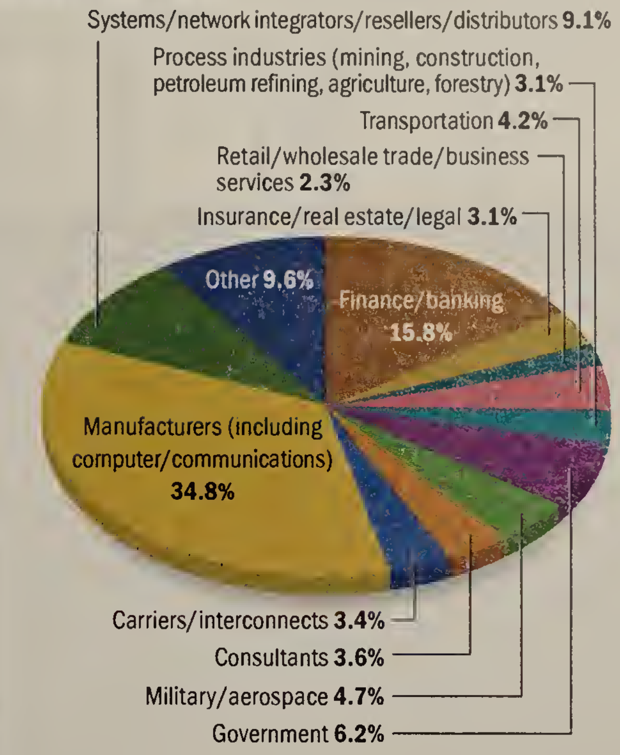
At CompuServe, Inc., the network services division has had significant difficulty finding workers with substantial expertise in Cisco router technology and Windows NT, according to Ramin Hashemi, director of CompuServe's network technical center. With more than 120 network-related positions open, the firm has begun hiring college graduates or people with limited experience and training them for positions it can't otherwise fill.

"We'd rather get the skilled technical talent, but there's such a shortage that we don't always have that luxury," he says.

CompuServe's problem is exacerbated by its location in Columbus, Ohio. Not exactly a technology mecca, Columbus also is experiencing a boom period in which the unemployment rate is currently below 3%, according to Hashemi. Still, if employees come to their bosses to report another job offer, CompuServe will not make counteroffers.

"We try not to get into that kind of bartering," Hashemi says. "It tends to lead to internal salary inequities."

WHERE THEY WORK



That's the reason that signing bonuses and other innovative compensation programs continue to be popular, says Jill Herrin, president of J&D Resources, Inc., a Memphis, Tenn., recruitment firm. Companies can get individual employees more money without skewing the pay scale for the entire firm.

"The sign-on bonuses are almost becoming run-of-the-mill," she says. "We're seeing $8,000 to $10,000 fairly regularly. And $2,000 or $3,000 is routine."

Salary innovation doesn't stop once employees come in the door, either. Last month, Bell Atlantic Network Services, Inc. moved to a competency-based model that rewards employees with raises of up to 10% for gaining certifications and advanced degrees, as well as bonuses for making a significant impact in their field, such as publishing a white paper or making a presentation at a major seminar.

"What we've found is that information technology people are motivated by increasing their skill sets," says Elizabeth Segal, a Bell Atlantic recruiting manager. "This model is a way to promote that. You can get this without getting a traditional promotion, which in the past was the only way to

Deloitte & Touche Consulting Group

FIND IT ON FUSION 1526

Deloitte & Touche Consulting Group, the sponsor of this year's Salary Survey, focuses on applying telecommunications expertise to solving business problems. The firm's consultants are typically business school graduates with an undergraduate focus in telecommunications or technical people with five to 10 years of consulting experience. The firm has networking centers in 15 offices around the world.

Check out the Deloitte & Touche Consulting Group Web site (www.dteg.com) for further information, including employment opportunities at the company.

Words of wisdom from professional recruiters

Cheri Comstock, president of The Focus Group, Chapel Hill, N.C.

How can you make yourself more valuable and increase the amount of money you earn?

"If you look at consulting organizations, those that are able to strategize with their customers instead of just supplying technical skills are making much more money. It's the same with individuals. The ones who are able to get in and understand the business decisions that drive the technology, these are the people who are making the most money."

Jill Herrin, president of J&D Resources, Inc., Memphis, Tenn.

What are some nonfinancial perks that network professionals are getting?

"We're negotiating three weeks vacation up front for a lot of people and either quarterly or semi-annual salary reviews, not waiting for the traditional one-year review period."

Herrin

What's the easiest way to attract promising network professionals?

"Generally speaking, technology people can be lured away with technology. A good, strong technical environment with a good, stable company that is leading edge/bleeding edge, that offers an attractive compensation plan. A lot of people will make the move for that."

Frank Schoff, president of Management Recruiters, Cedar Mountain, N.C.

Is making gut-level hiring decisions OK?

"Ultimately, the hiring decision is always made at the gut level. What you do in the interview process and the testing process is establish a whole lot of information that gives you the basis for that gut-level decision. It's not a scientific process."

What other questions should I ask myself about a prospective employee that cannot be answered by a resume?.

"How do I feel about the mental image I develop when I think about this person working for me, working with me, interacting with my other employers, my boss and my customers. Does that picture make me feel good? If that picture doesn't make me feel good and that person passes all the other tests, my gut will tell me, 'Don't hire them.'"

increase your pay."

The belief that incentives make technology workers more productive is at the core of an enhanced program for employees at Digital Equipment Corp.'s systems integration services division. In the program, bonuses of up to 30%, based on a combination of company performance and individual achievement, are awarded to technology workers as individual project goals are achieved.

The intent of the program is to tie compensation more directly to employee accomplishments, says Alan Zimmerle, a vice president for human resources at Digital.

"Our employees are incented to make sure customer problems are solved," Zimmerle says. "It widens their ability to earn money inside of Digital."

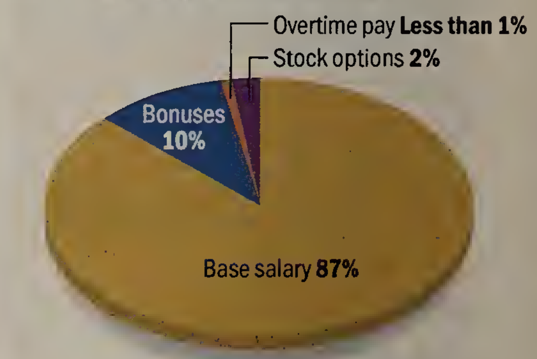
But even while Digital uses pay to retain workers, the company is conscious that money is not the only factor. Relationships among employees and between employees and customers are critical issues as well.

"We're learning that we have to ensure that the environment in which people work is a good one," Zimmerle says. "That means investing in team building with our folks and between our folks and our customers' folks in order to establish a good working environment."

Another part of job satisfaction is giving employees the ability to acquire new skills, either on the job or through outside training. In some cases, that can make up for pay that lags behind industry averages.

At Latitude Communications, a Santa Clara, Calif., maker of conferencing software, employees who had opportunities to move to other firms and gain experience on new technologies received what amounted to counteroffers. The counteroffers didn't include higher pay, but did include the ability to work on similar technology, according to Joy Strull, Latitude's information systems manager. Strull says because the company is a start-up, pay scales are lower than at many Bay-area companies.

TOTAL COMPENSATION BREAKDOWN



"If it makes business sense for us, then it's something that we will try to accomplish," Strull says.

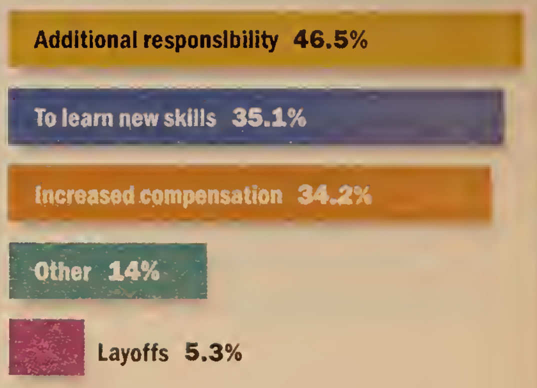
Latitude's approach makes sense in light of the survey results. The top two reasons for changing jobs, cited by 47% and 35% of respondents, respectively, were to gain added responsibility and learn new skills. Increased compensation lagged just behind, cited by 34%of respondents.

Part of retaining skilled people is making sure they are a good fit when they are hired. Increasingly, managers are filling positions temporarily with contract workers until they find someone who not only has the necessary skills, but also is a good fit with the company's culture and key coworkers.

"It's definitely a way for companies to source and try out full-time talent," says Mark Young, manager of consulting services at Howard Systems International, an Englewood, Colo., recruiting firm.

REASON FOR CHANGING JOBS

Based on 114 respondents – more than one response



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Typically, firms are precluded from offering contract workers full-time positions for eight to 12 months, Young says. Lately, though, some firms asked to reduce the period to four months. "Call it a four-month interview if you will," he says.

That approach just makes sense, says Terry Stader, MIS manager for Concord Communications, Inc., a 100-person maker of network diagnostic software in Marlborough, Mass. Stader says he used a dozen contract workers in a systems administrator position before hiring a full-timer several months ago. As it turned out, the person was not among the contractors who had done the job temporarily.

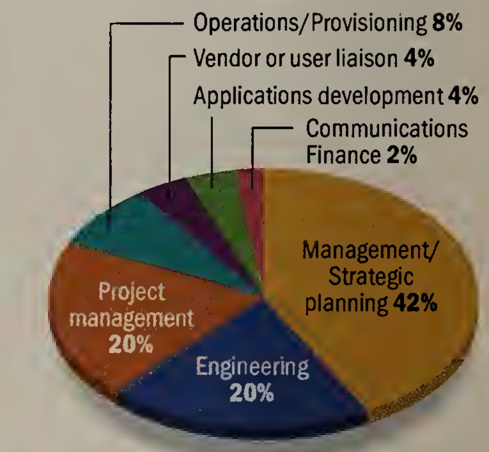
"From the various contractors we got a better feeling for what kind of person we would bring on full-time," Stader says. "We used them to help us figure out more about what the job was and what the right mix was."

Employers increasingly say that if technology workers want to make themselves valuable, they need to be able to approach their work from micro and macro levels.

"We want people with the ability to get down to the nitty-gritty and fix the problem," Stader says. "But they also need to be able to step back and see where the technology is headed, where the future lies for our network and the Internet and intranet connections for our activity throughout the world."

Looking ahead as technology workers mature, the challenge of keeping the best employees in place is providing a logical career path, says Deloitte & Touche's James. That might mean providing opportunities far afield from their initial technical expertise.

JOB FUNCTION BREAKDOWN



"The challenge of having those people with broader skills is that they are looking for more out of life than rearchitecting the network," he says. "You have to provide a way that they can move up by increasing their responsibilities and moving into areas where they might not have any expertise, such as marketing and sales."

For those ready to meet the responsibilities, it seems there's still no limit to what they can achieve, especially if they are willing to move on to new companies.

"If you've got skills and a heartbeat, you generally can find a place to land where you'll make more money," James says.

Duffy is a freelance writer based in Somerville, Mass. He can be reached via the Internet at tduffy62@compuserve.com.

Survey methodology

The 1997 *Network World*/Deloitte & Touche Consulting Group Salary Survey is based on 400 qualified responses from a randomly selected sample of the publication's subscribers. Only subscribers who specify, recommend or approve purchases of $10 million a year for network equipment and services and whose annual corporate gross revenue is at least $1 billion were invited to participate.

The survey requested that respondents provide salary and related information for themselves and the various titles reporting to them, as well as those for which they had reliable information.

The information was collected using a four-page questionnaire, which was mailed on May 28, and via telephone interviews of some respondents.

Directed and presented by Tom Jenkins, TeleChoice, Inc.

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REVIEW

THESE FOUR PRODUCTS EASE SECURE CERTIFICATION.
BUT ENTRUST'S WEBCA NUDGES ITS WAY TO THE TOP.

Certified communications

By Todd Coopee

When you're sending confidential data over the Internet, you don't want to be involved in the electronic equivalent of a blind date, where there's no way of telling who's on the other end. Rather, you want to go through a matchmaker to make sure you're hooking up with the right people.

Entrust Technologies, Inc.'s WebCA 1.0.1, Xcert Software, Inc.'s Sentry CA Apache Stronghold Release 1.2, Netscape Communications Corp.'s Certificate Server 1.01 and Frontier Technologies Corp.'s e-Cert 1.1 can just do that. They all enable you to issue and validate X.509 digital certificates that are used in tandem with encryption technology to protect communications between consenting individuals.

Essentially, certificates prevent someone from using a phony encryption key to masquerade as someone else. CA servers issue, store and validate the certificates in a secure manner (see story, page 52).

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Once you've grasped the underlying complexities behind digital certificates, it's easy to set up and configure a CA server on a private network with any of these four packages.

But Entrust's WebCA emerged as the Blue Ribbon winner based on its ease of installation, a good interface, low price and high scalability. The competition, however, has more strong than weak points. Netscape's Certificate Server is a good choice if you need to manage a large number of certificates and can put up with a lackluster installation procedure. Xcert's Sentry CA and Frontier Technologies' e-Cert have appeal as well, but only for sites with a heavy reliance on Unix and Microsoft Corp. products, respectively.

Trust in Entrust

As an early entrant to the market, WebCA is a great example of a no-nonsense CA server aimed squarely at the enterprise. WebCA's cross-authentication capabilities permit one CA server to authenticate certificates stored on other servers. Its unique pricing structure — $500 for 500 certificates — enables small-to-midsize companies to latch onto enterprise-level functionality for little money.

WebCA is appealing because of its product-level interoperability. Heavyweights such as IBM, Novell, Inc. and Hewlett-Packard Co. are building customized applications that use WebCA certificates. Even Netscape, despite its competing CA server product, is shipping a version of Communicator 4.0 with a browser that can communicate with WebCA.

WebCA runs on Windows NT 3.51 or higher and peacefully coexists with any Secure Sockets Layer (SSL)-enabled Web server running under NT, including Microsoft's Internet Information Server (IIS) and Netscape's Enterprise Server. We tested it with IIS 3.0 and ran into little difficulty. WebCA administrators will benefit from a painless installation process.

WebCA comes equipped with Entrust/Directory, a Lightweight Directory Access Protocol (LDAP)-compliant database it uses to store and manage certificate information for up to 5,000 users per server. If you need more certificates, WebCA provides hooks to larger X.500 directories.

The product ships with a sample certificate application form, Common Gateway Interface scripts and HTML pages, all of which can be tailored to meet your needs. Depending on access privileges and expiration date, you can issue as many types of certificates as needed.

WebCA can be set up to load users from an existing directory or to accept ad hoc certificate requests from individual users. Using an easily navigated browser-based interface, WebCA administrators can add users in bulk, revoke and delete users, modify certificate properties, including certificate lifetimes, and add and delete other administrators.

Users that need certificates for their browsers interact with WebCA over the Web as well, via a page that lets them submit certificate requests to the site administrator.

Most CA packages respond to user requests for certificates with an e-mail message that has a link to a Web page, where users go to get certificates. With WebCA, users can retrieve their certificates from an LDAP-based directory.

The only knock against WebCA is it doesn't automatically grant certain certificate requests. Without that option, administrators must always approve certificate requests, which could cause a backlog at sites serving a large number of users.

A strong Sentry

When looking at WebCA competitors, we found Xcert's Sentry CA 1.2 successfully debunks the myth that installing software under Unix requires a Ph.D. in operating system internals. It took less than 15 minutes to unpack the distribution file, run the install script and configure the product on a Sun Microsystems, Inc. SPARC 5 running Solaris 2.5.1.

On the server side, Sentry CA is compatible with the popular Apache Web server, provided it's running C2 Net, Inc.'s Stronghold module, which supports secure transactions. Don't worry, though. A complete Apache server package is included with Sentry CA. Unfortunately, Xcert does not yet have Sentry CA available as a plug-in for Netscape Enterprise Server or Microsoft IIS.

We were impressed with Sentry CA's feature set. The product supports cross-authentication with third-party certification authorities via secure

Score Card

		Features/ Protocol support (30%)	Administrative tools/Server support (30%)	Installation and documentation (20%)	Capacity/ Expandability (10%)	Cost (10%)
8.9	WebCA	8	9	10	8	10
8.1	Sentry CA	9	6	10	9	7
7.8	Certificate Server	8	9	5	9	8
7.3	e-Cert	6	7	9	7	9

Scores are based on a scale of 1-10. Percentages are the weight given each category in determining the overall score.

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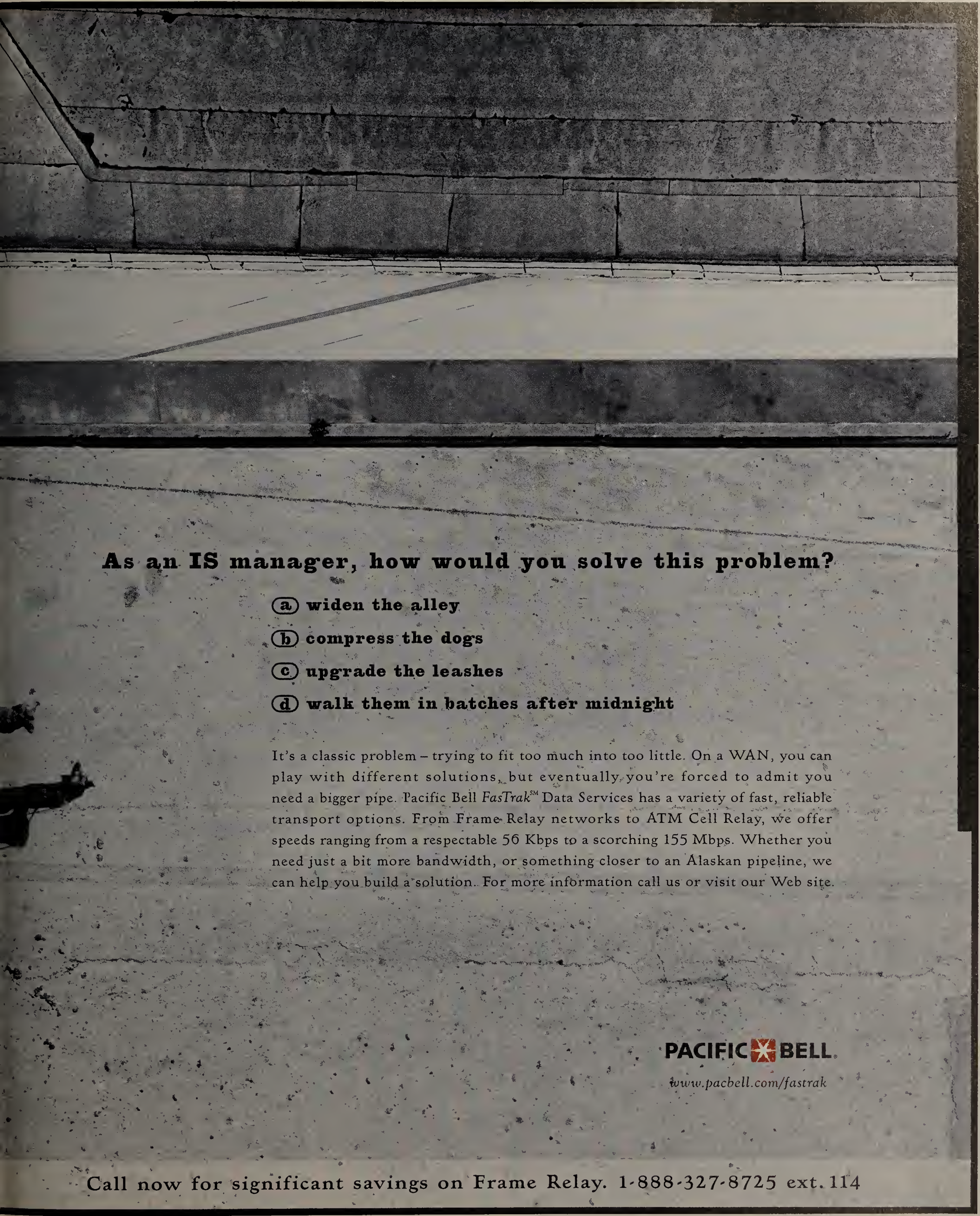

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- ⓑ compress the dogs
- ⓒ upgrade the leashes
- ⓓ walk them in batches after midnight

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LDAP, which means you can accept and process certificates from other CAs on your LAN. You also get Access Control List (ACL) modules, which enable you to grant or deny access to various resources based on a user's certificate. It was a snap to create several ACL objects to limit access to various directories on our Web server based on a certificate's organization name.

If you're interested in incorporating cryptographic devices such as smart cards into your security mix, Sentry CA's out-of-box support for Public Key Cryptogtaphy Standards (PKCS) #11-compliant devices is a big plus. This makes it possible for Sentry CA to sign certificate requests made using Litronic, Inc. NetSign smart cards and Fischer International, Inc. Cryptographic Tokens, both of which are hardware devices that users plug into a client-attached reader to identify themselves.

Like competing products, interaction with Sentry CA is accomplished through a standard Web browser. Using forms provided with the product, users can request certificates and administrators can approve and e-mail responses.

Certificate requests can be automatically issued without the need for administrative intervention — a real boon for sites with high-volume certificate needs.

Speaking of certificates, you can't create them on your own with Sentry CA. Rather, you have to purchase certificates from a third party, which adds to your overall cost.

On the back end, Sentry CA's Xcert Universal Data API (XUDA) provides a number of options. Besides giving you flexibility in the database you use to store certificates, the XUDA tool kit can be used to develop applications requiring public-key certificates, SSL transactions and secure database access.

Net Results

	WebCA 1.0.1	**Sentry CA 1.2**	**Certificate Server 1.01**	**e-Cert 1.1**
	Entrust Technologies, Inc. *(613) 247-3411* *www.entrust.com* *$500 for 500 certificates*	*Xcert Software, Inc.* *(604) 640-6210* *www.xcert.com* *$1,495*	*Netscape Communications Corp.* *(415) 937-2555* *www.netscape.com* *$995*	*Frontier Technologies Corp.* *(800) 929-3054* *www.frontiertech.com* *$799*
PROS	▲ Price ▲ Easy to install ▲ Good administrative interface	▲ Easy to install ▲ Strong set of features	▲ Good administrative tools ▲ Scalable ▲ Includes Informix database	▲ Easy to install ▲ Part of bundled package
CONS	▼ Limited scalability ▼ Lacks some advanced features	▼ Limited Web server options ▼ Does not create its own certificates	▼ Quirky installation process ▼ Spotty documentation	▼ Supports limited server types ▼ Heavy reliance on Microsoft products

Navigating Netscape's Certificate Server

Although it doesn't have all of Sentry CA's advanced features or WebCA's enterprise strength and streamlined interface, Netscape nonetheless checks in with a solid offering.

Like other Netscape servers, Certificate Server runs under Windows NT and a slew of Unix variants, making it easy to squeeze into your net.

Certificate Server supports a maximum of 10,000 certificates per server, and because it can be purchased as part of Netscape's SuiteSpot Professional Edition, it benefits from a fairly seamless integration with other Netscape products.

The best aspect of Certificate Server is its browser-based interface. While not as straightforward as WebCA's, it enables you to configure most aspects of the server via simple forms included with the product. Thanks to a certificate that gave us administrative rights, we used SSL to log on to Certificate Server, create customized policy templates and grant, revoke and search for certificates.

Acting as a user, we requested personal and server certificates by filling out forms and placing them in an administrative queue for approval. Both types of certificates we got worked with the latest releases of Navigator and Internet Explorer once we set up those browsers to work in a secure environment.

Certificate Server is bundled with Informix Software, Inc.'s Online Workgroup Server, which is used for certificate storage and management. The database keeps track of a certificate's life cycle, including when it was created, who signed it and when it was revoked.

If you support LDAP, Certificate Server also has direct links to Netscape's Directory Server, which enables you to put certificates and certificate revocation lists in LDAP directories.

Our enthusiasm for Netscape's product is tempered by its lackluster installation procedure. Part installation wizard, part command line, the process is a hodgepodge of instructions that left us a bit befuddled.

Finally, Frontier

Installation of Frontier's e-Cert 1.1 on a Pentium-based PC running Windows NT Server 4.0 was a bit smoother, thanks to an Install Wizard. The product is one of three complementary security components in Frontier's overall e-Lock family. You use e-Cert to issue and manage certificates, e-Sign to digitally sign any type of file or document and e-Mail to encrypt and digitally sign e-mail messages via the Secure/Multi-purpose Internet Mail Extensions protocol. The other CAs we examined support products similar to e-Sign and e-Mail, but only Frontier bundles them with a CA server.

With e-Cert, you get one of the few CA packages capable of supporting multiple certificate storage databases. You can choose any Open Database Connectivity-compliant database management system, most any SQL-based commercial DBMS or an LDAP directory.

To ease setup chores, e-Cert borrows heavily from the Microsoft wizard concept.

Frontier also includes a number of handy sample programs, including one that automatically issues and returns certificates to a user via a Web browser.

As a CA server, e-Cert is easy to use and adheres to industry standards such as PKCS. But it lacks several useful features. For instance, there is no simple way to issue certificates to users. A user-created certificate request file or a certificate from a public CA must be manually moved to the e-Cert server by loading it from disk or copying it from another machine over the network. At this point, the administrator must import the request, examine it and then decide what to do with it.

Another potential drawback lies in e-Cert's heavy reliance on IIS and Internet Explorer. If you've got a heavy investment in Unix or Netscape products, you'd do well to look elsewhere.

Coopee is the assistant director of technical services at Trinity College in Hartford, Conn. He can be reached via the Internet at todd.coopee@trincoll.edu.

CAs demystified

The term Certificate Authority (CA) has its roots in the world of public-key cryptography, where users get a public key that is published and freely available, plus a private key that is kept secret.

Confidential messages are encrypted and sent using the public key and can only be decrypted using a private key, which is in the sole possession of the intended recipient. Although the public and private keys are functional inverses of one another, the use of large key sizes makes it almost impossible to determine the unknown half of someone's key pair by using a known half.

Unfortunately, encryption is only half the battle. Suspicion can still abound. How do users know if they have actually attained the public keys of their partners in communications? Is a user truly who he says he is or is someone impersonating him? And how does one user know if another can be trusted?

Digital certificates and CA software help answer these questions. Certificates are used to prevent someone from using a phony key to masquerade as someone else, and CA servers issue, store and validate those certificates in a secure manner.

To ensure universal use and access, all certificates are based on the X.509 standard, which is supported by a number of security protocols, including the Public Key Cryptography Standards, the Secure Sockets Layer Handshake Protocol and the Secure HTTP.

— *Todd Coopee*

The real cost of a bad hire

How mediocre employees can put a drag on the bottom line.

By Loretta Prencipe

A U.S. modem manufacturer recently lost $100 million per month in market share as a result of making a bad hire, according to calculations by a human resources management expert. This company and others are beginning to realize that a bad hire can cost millions of dollars in lost revenue — it may even fold the business.

These new notions of a bad hire are breaking the mold. Mediocrity is to be avoided at all costs, according to Dr. John Sullivan, HR management professor at San Francisco State University, consultant and founding executive director of the California Strategic Human Resources Partnership, a consortium of Fortune 500 executives.

"People are a company's resource. Not the coffee. Not the building. Mediocre employees produce less per dollar of cost . . . that makes the inefficient use of funds a major corporate weakness," Sullivan says. He also states that employment is a companywide strategic resource that significantly affects customer satisfaction and profitability.

Companies traditionally saw a bad hire from a manufacturing viewpoint, using notions such as manager time, discipline problems and training. Although these are still legitimate costs, "it's a '60s mentality," says Gerry Crispin, chair of the Society of Human Resource Management's National Committee on Employment. "In the '90s, companies have to ask themselves, 'What is the impact of a bad hire in terms of bringing a product or service to market? What is the cost of delaying a major product one week or one month?' "

In the case of the modem manufacturer, Sullivan calculated the $100 million per month figure for the unidentified company.

IT managers may not want to face reality, but the bottom line demands they figure out how much a bad hire costs. A bad hire can delay response time, hurt customer support, cause network outages and reduce productivity in a new rollout or upgrade project.

Sullivan offers this scenario: The first week a new employee is on the job, his manager realizes that he's a drain on resources. His network skills are lacking, and he doesn't work well with the team, thus delaying a network operating system upgrade by three months. HR is brought in, but it takes three months to fire him. Then it takes another three months to hire a replacement. The new employee needs another three months to get up to speed. A whole year is wasted, the company's product isn't released on time, and market share is lost.

But that's not the only way a bad hire can repress a company. Sullivan and other experts can produce a list a mile long of how bad hires — or mediocre hires — negatively transform a company.

Bad hires generally are high-maintenance employees that require more management time and effort than good hires. This is time you spend away from profit-producing tasks and productive employees.

And productivity is the name of the game. Bad hires are less productive and make more errors. These errors can harm your business reputation and result in more downtime throughout the company. Why? Because errors require correction. If you're lucky, another employee will correct the problem. If you're not so lucky, the client will ask your competitor to do it.

Sullivan warns that mediocre employees further harm your competitive advantage by signaling to your competitors that you're becoming weak. Such a message encourages them to be bolder and may even improve their image. What's more, this bad hire is taking a spot on your team . . . not your competitor's.

What's worse than missing the opportunity to hire a good employee? Losing the ones already on board. Bad hires can drive your superstars away. "Superstar employees often resent being on the same team with losers," Sullivan says. Good employees also may get the message that the company is on the decline and look for a new place to shine and be challenged.

While no one sets out to hire a mediocre work

ONE BAD APPLE CAN SPOIL THE BUNCH

A bad hire doesn't exist in a vacuum. Here's how a bad employee can adversely affect the company's bottom line.

- Requires more training.
- Increases administrative costs by requiring more management intervention.
- Wastes team time by requiring colleagues' help.
- Makes more errors.
- Portrays a negative image to clients.

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force, it happens because recruitment efforts are weak. The goal is to keep bad hires to a minimum and increase the number of superstars. Sullivan explains that a company with poor recruitment and selection techniques could soon find itself muddled in mediocrity.

"If you have a 20% turnover [rate] per year and hire only mediocre people, in five years your entire work force is mediocre," he says.

Crispin adds: "The cost of a bad hire will hit you, regardless. You can't get rid of them fast enough."

> WHAT IS THE IMPACT OF A BAD HIRE IN TERMS OF BRINGING A PRODUCT OR SERVICE TO MARKET? WHAT IS THE COST OF DELAYING A MAJOR PRODUCT ONE WEEK OR ONE MONTH?
>
> *Gerry Crispin*
> *Chair of the Society of Human Resource Management's National Committee on Employment*

Prencipe is an attorney in Springfield, Va., who prefers the gentler art of freelance writing on legal and employment topics. She can be reached at LWPrencipe@aol.com.

What's wrong with mediocrity?

Do you think mediocrity makes for a bad hire? Toni Moore begs to differ. Moore, manager of staffing for Lockheed Martin Management & Data Systems believes mediocrity has its place. "Every company has constant, routine work for average performers. Companies need to recognize this," Moore says. Job fit needs to be maximized. Employees must be matched to the work assigned. If a superstar is put in a mediocre position, he'll be unchallenged and likely will leave the company.

Moore would challenge the pundits to look at the categories of a company merit chart: excellent, fully satisfactory, satisfactory and below average. She notes, "Satisfactory [employees are] fully capable of doing the job and meet all expectations of the job. They don't do more. They don't do less."

Are those "satisfactory" people bad hires? Not according to Moore. "They're certainly performing, and they're an asset to the company, and they're helping the company meet its goals," she says.

— *Loretta Prencipe*

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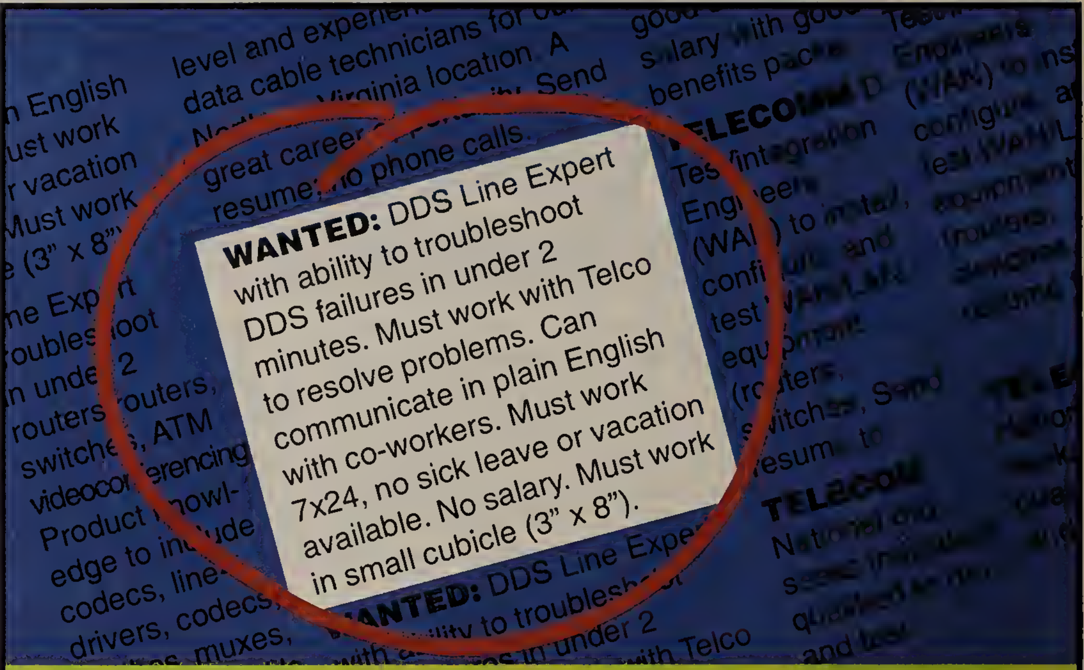

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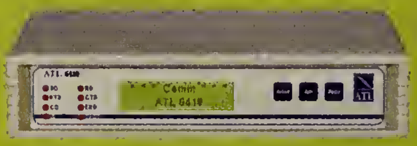

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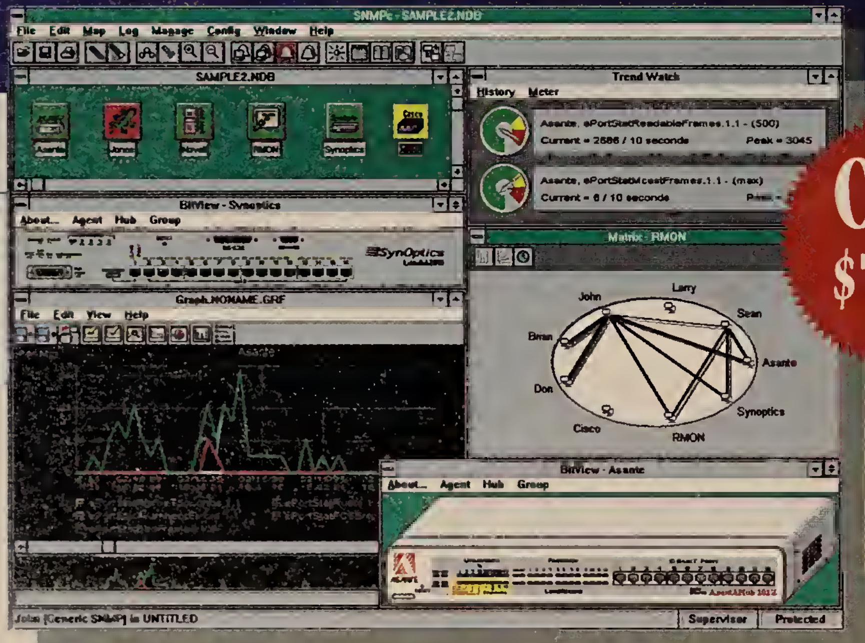

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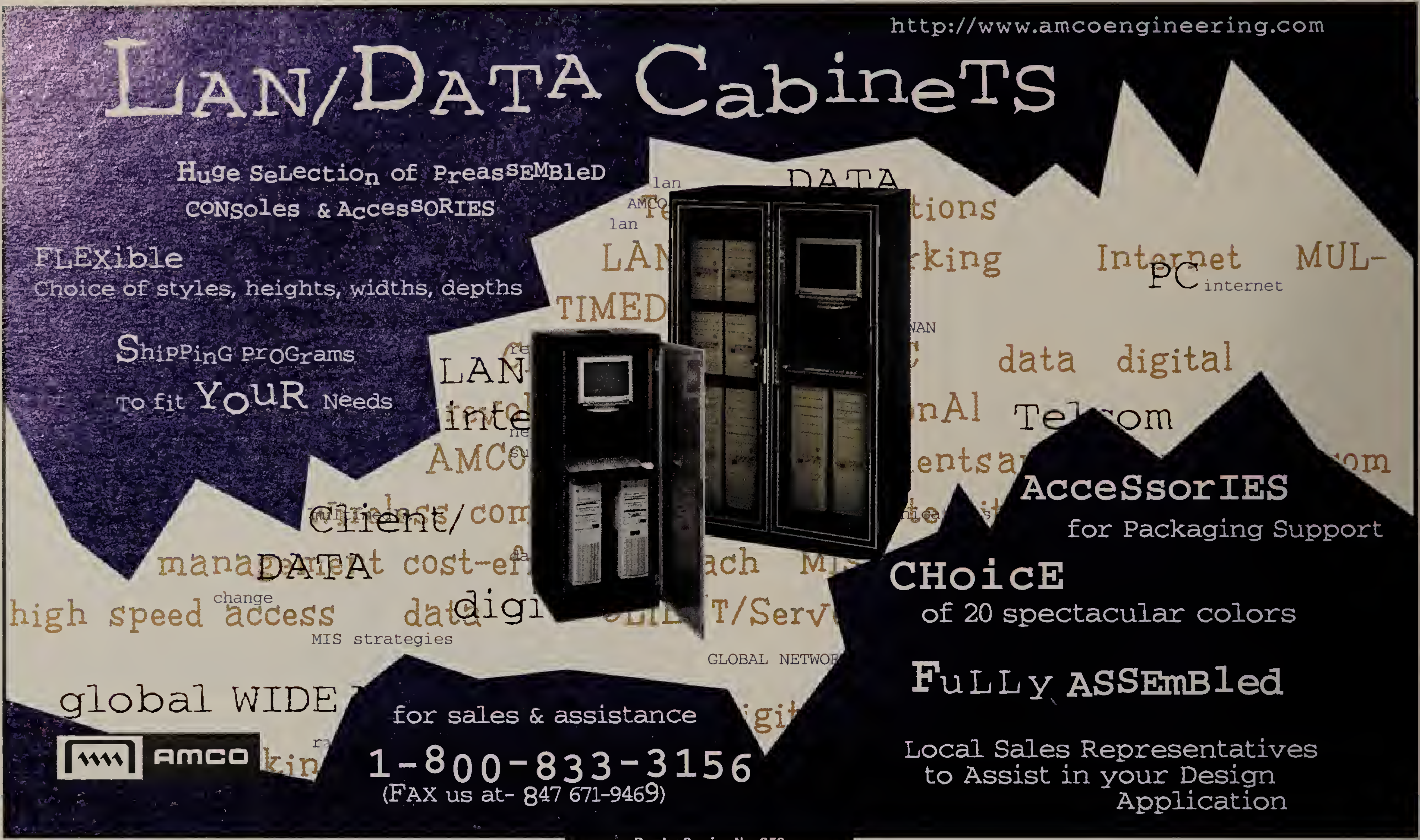

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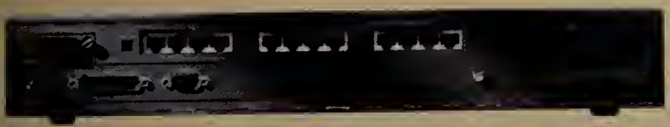

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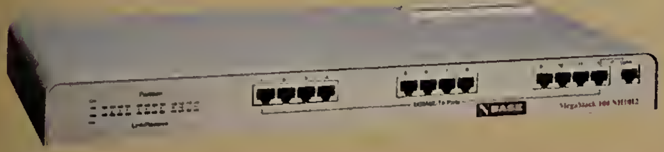

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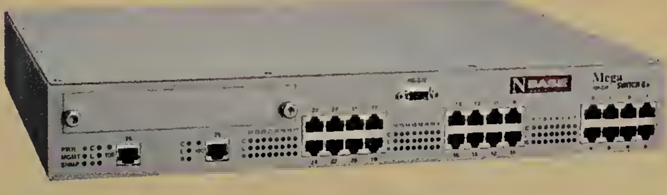

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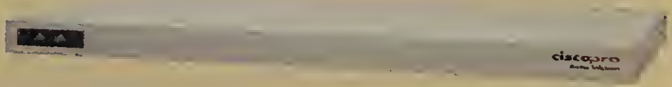

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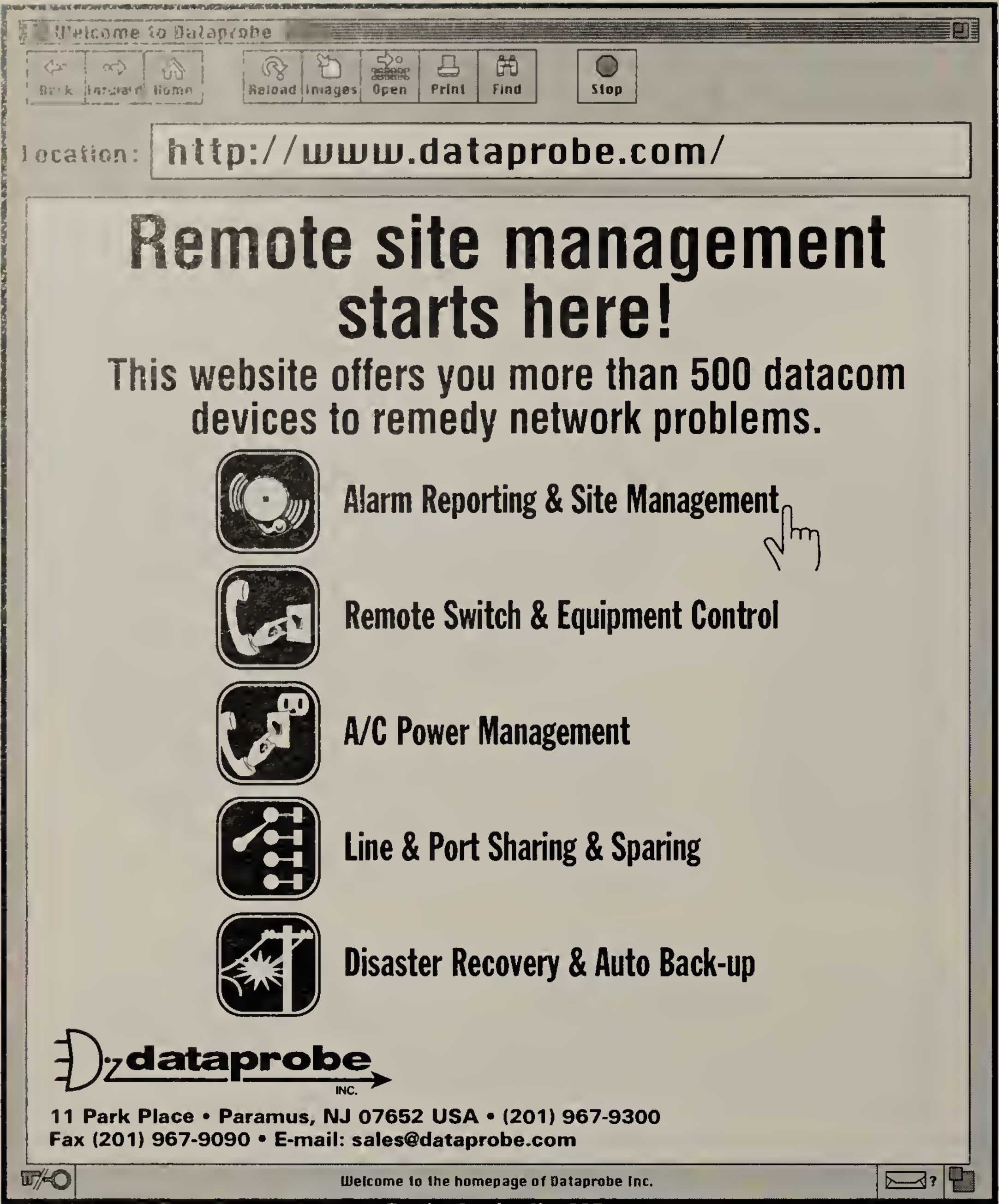

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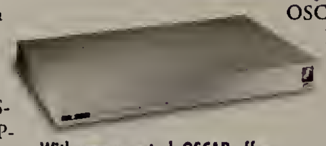

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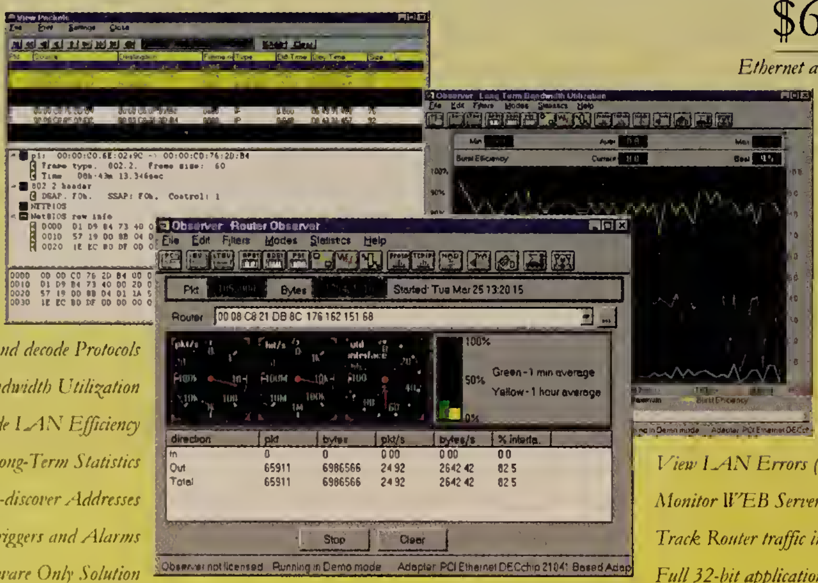
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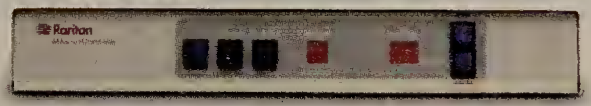

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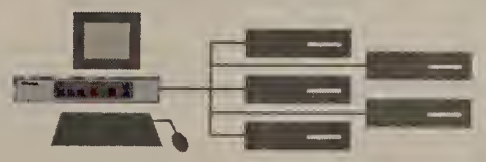

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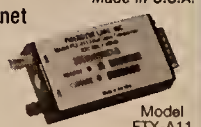

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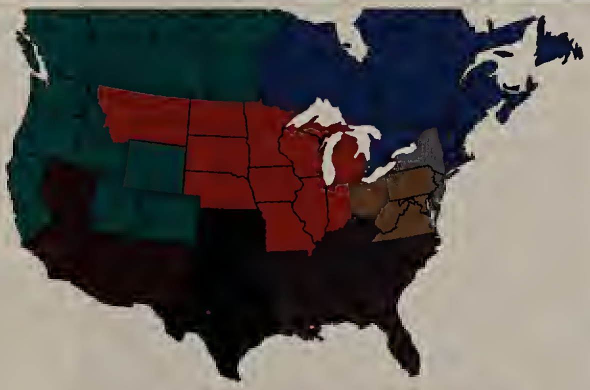

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Surge

Continued from page 1

than as an integrated part of GroupWise. Novell officials also have spoken in the past of adding support for Network News Transfer Protocol (NNTP) and Secure Multi-purpose Internet Mail Extensions (S/MIME) in upcoming versions of GroupWise. However, officials declined to confirm details about Surge's feature set or timetable.

"The release schedule and feature set is not fixed for the next release," said Eldon Greenwood, director of product management for the Novell GroupWare Division. "But NNTP is one of the technology areas that we want to fill."

So, too, is S/MIME, he said, despite its recent derailment from the Internet Engineering Task Force's standards track. "It's our belief that [RSA Data Security, Inc.] will try to get S/MIME back on the standards track," Greenwood said. "It's a customer requirement [for Novell] whether it becomes a standard or not; we just hope it becomes a standard."

GroupWise customers said they are pleased with Novell's continued emphasis on extending Internet hooks and functionality.

"Like Netscape, they want to put LDAP integration inside of the GroupWise client so that it can find out addresses of other people in other directories, like 411," said one regular beta tester who requested anonymity. "That will actually be pretty significant [because] right now you're limited to what's in the GroupWise address book.

"They showed us a bunch of fancy things involving scheduling that go significantly beyond what they have now," he added. "They said this stuff was speculative, though."

Another customer that participated in the GroupWise 5.2 beta believes Novell is doing good work with its Web client.

"The [GroupWise] Java Web Access is really sharp," said Travis Berkley, supervisor of LAN support services at the University of Kansas. "That just needs one of two more features thrown in, and it will be just as good as the native desktop client."

What's in Version 5.2?

As for the imminent release of GroupWise 5.2, the beta testers were universal in their praise. The upgrade adds support for Post Office Protocol 3, Internet Message Access Protocol 4 and LDAP on the server; dial-up Simple Mail Transfer Protocol; and in the Web client, support for the HTML 3.2 frames environment.

"Early September is what we're saying, and it could conceivably be [this] week," said Greenwood, of Version 5.2's shipmentdate.

✆ Novell: (801) 222-6000

CORRECTIONS

In response to a request for proposals, MCI Communications Corp. offered Richmond, Va.-based Wheat First Butcher Singer, Inc. a signing bonus of a month's credit on frame relay charges. We previously reported that MCI had offered to "buy out" the brokerage firm's existing AT&T frame relay contract (*NW,* Aug. 11, page 24).

We transposed two numbers in the phone listing for CommVision Corp. in the Net Results chart that accompanied the Aug. 18 review of consolidated servers. The number that should have run is (415) 254-5720; however, that number is changing to (415) 254-9300.

Due to an editing error, incorrect contact information was listed in the Aug. 25 issue for Tom Stenson, the author of the feature "Serving up support." He is CEO of the consultancy M5 Systems, Inc., of Braintree, Mass., and can be reached via e-mail at tstenson@m5sys.com.

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Token ring

Continued from page 1

Gigabit Ethernet and ATM, industry observers said.

Even IBM — the godfather of the token-ring marketplace — agreed.

"[People] migrating to Ethernet feel forced to do so due to a lack of a future path for Token Ring," said Dave Olechovsky, Token Ring product-line manager in IBM's Network Hardware Division. "If a future path — like High-Speed Token Ring — is offered quickly, then customers would be more comfortable staying with token ring."

DAVE BRADLEY

Dave Olechovsky, *IBM Token Ring product-line manager, was one of the attendees at the second Token Ring Futures roundtable.*

"Token ring is strategic again," said Kevin Tolly, president and CEO of The Tolly Group, a Manasquan, N.J.-based consultancy. "Customers soon will be able to scale their networks to 100M bit/sec, 1G bit/sec and beyond."

In fact, High-Speed Token Ring might arrive in time to save Tony Villani at Hingham Mutual Fire Insurance Co., in Hingham, Mass., from ripping out his Cisco token-ring switches in favor of Ethernet devices.

"There's no question that 16M bit/sec token ring isn't going to suffice forever, so this [High-Speed Token Ring standard] is comforting," Villani said. "Now we can take a wait-and-see approach and hopefully stick with token ring."

But Tom Jacobs, product-line manager for multi-LAN switching at Bay, said bandwidth is not the only motivation for migrating to Ethernet.

"Cost is going to be a key issue with High-Speed Token Ring," Jacobs said. "This has got to be a very cost-effective upgrade path for customers to embrace it." The vendor group agreed, but said it was too early to talk about pricing.

What to expect

The High-Speed Token Ring standard, which will be handled by the IEEE 802.5 committee, will be divided into three parts.

DAVE BRADLEY

The first will be a 100M bit/sec copper specification that will use 100Base-TX as the physical layer. At the same time — or shortly after — the group will roll out a 100M bit/sec fiber specification that uses 100Base-FX as the physical layer. Later there will be a 1G bit/sec token-ring standard, which will most likely first be a fiber version.

The proposed schedule calls for the first draft of the standard to be written by November, all major technical issues resolved by early spring and a final standard released in early summer.

"Time is absolutely of the essence," said Robert Love, chairman of the IEEE 802.5 committee. "We have to be running."

> *"More than half of the token-ring customers we surveyed will continue to deploy token ring and have no plans to abandon it. And 70% of those users sticking with token ring would like a high-speed pure token-ring alternative."*
>
> **Tom Jacobs,** product manager of multi-LAN switching, Bay

Primary design goals for the project include preserving most of the key attributes of today's token ring, such as large frame size, source routing and priority levels.

The group also agreed that High-Speed Token Ring will support the IEEE 802.1q standard for multiple virtual LANs, which would allow Ethernet and token-ring users to share the same server, for example.

In addition, the 802.5 group will attempt to develop the dedicated High-Speed Token Ring standard while leaving the option open for a shared version.

"I don't think customers are ever going to need shared [High-Speed Token Ring], so I don't want to see it slow down the standards work even a week," Tolly said.

Another nice feature to look forward to is autosensing token-ring devices. "We'll probably want to have 4M/16M/100M bit/sec switches and adapters that would share the same wiring requirements," Love said.

That appeals to Villani. "A switch that could do all three speeds would be great," he said.

And it sounds a lot like the Ethernet world, which is inundated with 10M/100M bit/sec switches.

The industry does not, however, see the new technology as making token ring a stronger Ethernet competitor, but simply a tool to help existing users.

Milestone meetings

At the roundtable, vendors set up a series of milestone meetings aimed at keeping standards and product development work at the forefront. Among the events:

- In mid-September, IBM will host a meeting in Research Triangle Park, N.C., to create the High-Speed Token Ring Alliance, which will have a technical and marketing arm.
- Tolly will moderate a panel discussion on High-Speed Token Ring at the GigaNet conference in San Jose, Calif., in December.
- Independent consultant Anura Gurugé will chair a High-Speed Token Ring discussion at the ComNet '98 show in Washington, D.C., in February.

But will the participating vendors in the High-Speed Token Ring Alliance stick together once they get into the nitty-gritty technical details of the standard? And will they really be able to meet such aggressive standard and product development schedules?

Love thinks so. "There's no new technical development that's needed here, so I think we might even be able to beat our proposed timetable," he said.

But optimism aside, the High-Speed Token Ring Alliance faces a grueling schedule, and its success is by no means assured. In fact, the last pro-token-ring consortium — the Alliance for Strategic Token Ring Advancement and Leadership — was by all counts a failure. ■

Multivendor manifesto

Token-ring vendors agreed to the following:

To pursue an IEEE 802.5 standard for dedicated High-Speed Token Ring that scales from 100M bit/sec to at least 1G bit/sec. The standard will support key attributes of today's token ring and will be developed in time to allow for multivendor demonstrations of High-Speed Token Ring technology at NetWorld+Interop '98 in Las Vegas. The standard will support the IEEE 802.1q standard for multiple VLANs. The goal of this standard effort is to deliver the most cost-effective upgrade path for token-ring customers.

Participating vendors:

- ▶ 3Com
- ▶ Bay
- ▶ Cabletron
- ▶ Cisco
- ▶ IBM
- ▶ Madge
- ▶ Novacom
- ▶ Olicom
- ▶ Proteon
- ▶ Silicom
- ▶ Texas Instruments
- ▶ Treseq
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Site Hosting

Less is more with DG's new Web server

SiteStak servers to give access to as many as 160,000 Web pages at once.

By Marc Songini
Westborough, Mass.

Better to excel at one thing than be mediocre at many.

That is the thinking behind Data General Corp.'s new family of Intel servers whose sole function is to give access to Web pages — as many as 160,000 at one time.

Next month, Data General will release its SiteStak TW-500, the more powerful of the two Web boxes it is developing, along with its lower end version, the SiteStak TW-150.

Unlike general-purpose servers, SiteStak TW-500 comes preconfigured with all the software it needs to host Web sites.

The 200-MHz Pentium box runs a scaled-down version of Microsoft Windows NT and comes already tuned for HTTP traffic.

According to the company, all that is required to start using SiteStak is to connect it to 10M/100M bit/sec Ethernet and tie it to a Dynamic Host Configuration Protocol or Reverse Address Resolution Protocol server to set up network address information. The system, which lacks a keyboard, mouse or display, is configured by a Web browser.

The stackable boxes are about 2 feet long and 1 foot wide and require only 1 3/4 inches of rack space.

Each device can automatically recognize other SiteStak boxes in a cluster, Data General officials claimed. Large Web sites can be spread across multiple devices, or a number of small sites can be contained within a single box.

SiteStak is compatible with authoring tools such as Microsoft Corp.'s FrontPage and Netscape Communications Corp.'s Page Composer.

In addition to the Common Gateway Interface, it supports server scripting via Perl, VBScript and JavaScript.

Pricing will be less than $8,000. Both products will be released in early September.

✆ Data General: (508) 898-5000

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Backspin

Barney the dinosaur opens up a whole new world

Microsoft, robots and media domination.

If you don't know Barney the dinosaur, you're either one of our readers living in a country far away from the U.S. or you don't have kids.

Barney is a 7-foot-tall, gushingly cutesy character on a children's television program that makes my teeth ache. On the other hand, my 4-year-old son likes Barney a lot. So as far as he's concerned, Dada does too.

And if there's one thing Barney is, it's merchandisable. The Purple One has been turned into comic books, cartoons, stage shows and now, thanks to Microsoft, a robotic toy.

With this toy, Microsoft is launching its ActiMates product line— toys that interact not only with your child, but also with televisions and PCs. Actually, Microsoft(R) refers to this as the Microsoft ActiMates(TM) Early Learning System, so you can expect a whole stream of related products.

ActiMate Barney is being launched in the U.S. this month, just in time for the Christmas buildup. I reckon that this toy could be the Tickle Me Elmo of 1997.

Once we heard of the Microsoft toy here at the Gibbs Institute, we had to get our hands on a review unit. It arrived a couple of days ago and was immediately sent to our state-of-the-art test facility (the family room here at Gibbs Towers) and given to the Head of Child Consumer Products Testing, my son, Keihan.

> *Thanks to Microsoft, the Purple One has been changed into a robotic toy.*

Barney went down well. The toy itself is 16 inches high, plush-covered and contains a box full of electronics (six AAA batteries not included). Actually, I was a little surprised at the construction; the cuddlability is reduced significantly because you can feel the innards through the plush.

You switch Barney on by squeezing his hand, and he immediately waves his arms around and starts to talk, a trick that elicited a "Wow" from our Head of Testing. Microsoft describes the movements as "lifelike," which simply shows that someone in Microsoft's marketing department needs an increased dosage of medication.

Squeeze the middle finger of either hand and Barney will play one of 12 games, while squeezing a middle toe will invoke one of 17 songs. Cover its eyes and it will play peek-a-boo. This got a laugh out of the Head of Testing and Dada.

The voice is provided by a synthesizer and is a pretty good imitation of the TV Barney (if you like that sort of thing). It has a built-in vocabulary of 2,000 words. All this for $109.95.

Install the optional $64.95 transmitter between your TV and VCR, and Barney will comment on the shows via specially prepared tapes that cost $14.95 each. Our Head of Testing didn't like this, describing Barney's commentary as too distracting.

In what is quite a coup, Public Broadcasting Service television stations this fall will start broadcasting Barney shows with the encoding embedded to drive the toy. I hope PBS gets a ton of cash for its cooperation on this venture.

An optional $64.95 transmitter with one CD-ROM plugged into your PC's game port will let Barney interact with educational games, shouting out encouragement such as "That's right!" and "You're stuuuu-pendous!" The Head of Testing thought this was pretty good.

I may sound a little cynical, but it is actually an interesting toy and potentially an educational one.

What interests me is that with Bill Gates entering into the mass media business — and make no mistake, we're talking world domination-type goals here — he's also trying to create a truly new media.

Imagine Barney and his other ActiMate friends tied directly into Teledesic, the satellite-based communication system that Gates is partially funding. Hmmmm. I wish I had more space to ponder this aspect.

How about people-size ActiMates populating your customer service department? Would anyone notice? And imagine people-size ActiMate companions. You can just hear it: "You're so handsome, so virile." And, of course, they are automated...

Will you be buying your little one a robot Barney? Send your purchasing plans to nwcolumn@gibbs.com or test your voice synthesis at (800) 622-1108, Ext. 504.

'NET BUZZ

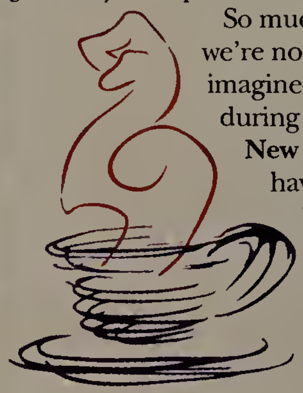
The latest on the Internet/intranet industry

By Chris Nerney

The following 'Net Buzz has been written in 100% Pure Java.

THROUGH THE JAVA LOOKING GLASS We were somewhere around Times Square when the effects began to take hold. We thought we would never succumb, that we could maintain our perspective in the vortex of fervent hope and belief that was last week's **Java Internet Business Expo (JIBE)** in New York. Well, know this: The **Java Hype Machine** is mighty and persuasive. It is a steamroller, baby, a churning urn of burning **100% Pure Java** funk. Besides, even we cannot resist the siren call of a future that includes a Java-enabled electronic recipe holder. We had Java Fever, and we knew it.

We needed an object-oriented salve to cool our burning brow, and we needed it fast. Finding none handy on 42nd Street, we ducked into a nearby tavern to regroup over several more beers than indicated on our expense report. Our head swam as we tried to make sense of conflicting messages. Is Java the prodigy that will revolutionize our networked world, as proud parent **Sun Microsystems** assures? Or is it, as some fear, a somewhat slow performer encumbered by outsized expectations? **IBM Senior Vice President John Thompson** told conference attendees that "the reality is now," yet *The Wall Street Journal (WSJ)* insinuated in a front-page article (which was the subject of much teeth-gnashing at JIBE) that Java is "failing to live up to its billing." Heretics! A developer citing concerns about the rapidly changing language of Java may have put it best when he said, "Java is a moving target."



So much information was crammed into our heads at JIBE, we're not even sure what was actually said and what we merely imagined. Did we actually hear Sun CEO **Scott McNealy,** during his opening keynote address, rattle off the **Top Ten New Fall Shows on MSNBC?** We must have, for why else have we been scanning our *TV Guides* for *60 Minutes: The Windows Reboot Story* and *Late Night with Microsoft Support?* Unfortunately, we cannot banish from our mind the thought of calling Redmond with a question about Internet Explorer 4.0, only to be transferred to **Sandra Bernhardt.**

And what of **Microsoft?** The company had a sizable presence on the JIBE show floor, and it was cited by McNealy (between numerous digs) and others as a Java licensee. Yet a full-page advertisement in the *WSJ* on Thursday listed 446 companies that have embraced the Java platform, none of which were named Microsoft.

We recalled seeing **Corel Corp.** workers in the JIBE exhibit hall, proudly touting Office for Java to conferencees. Yet how could that be? Hadn't Corel announced last week that its long-awaited desktop application product would never see the light of day? Yes and no, Corel said. While the Office for Java body will be buried, its organs would be transplanted to CorelCentral, a personal information manager, so it may prosper in the brave new Java world.

What madness was this? We search our memory banks for something tangible to cling to. Ah, the announcement by **Marimba, Inc.** that it is submitting to the **World Wide Web Consortium** a proposed Distribution and Replication Protocol. What is more tangible and down-to-earth than technical standards? Plus, if **Kim Polese** is doing it, it must be valid! But wait. We also recall that **Novadigm, Inc.** has filed a patent infringement lawsuit against Marimba over that same technology, leading one wicked wag to chortle over "the fall of Queen Polese."

We were now delirious, our brain in Java-powered, cross-platform overdrive. We staggered onto the streets, the streets of a city that proclaimed last week to be Java Internet Business Week, and then demanded a hefty tip. Nothing like the fresh air and friendly spirit of New York to bring you back to your senses. We felt ourselves coming down, re-establishing our grip on reality.

We turned the corner, dodging several street people soliciting us for seed funding. We told them to submit business plans, no more than two to four pages long, as recommended during a panel discussion by **Java Fund** director **Ted Schlein.** Entering Times Square proper, we gazed up in time to see the famous Coke bottle slowly morph into a giant Java cup, it's wafting tendrils of steam emulating our tenuous relationship with sanity. We kept walking, knowing we could never go back to our pre-Java existence.

'Net Buzz is resting comfortably and would appreciate cards and letters from well-wishers, along with your best Internet- and intranet-related news. Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.

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